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Dialogical dynamics and argumentative structures in dispute mediation discourse

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Contents

List of Figures

List of Tables

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Declaration

I, Mathilde Janier, hereby declare that I am the author of this thesis; that I have consulted all references cited; that I have done all the work recorded by this thesis; and that it has not been previously accepted for a degree.

Abstract

Dispute mediation is a practice in which third-neutrals (mediators) help conflicting parties to resolve a dispute in civil cases such as divorces, child custodies or in the workplace for example. Mediation is becoming a major dispute resolution process in most countries; for instance, calls to mediation services are increasing, and many countries make it mandatory to resort to mediation before going to court. This is because it presents many advantages over traditional litigation: it is quicker, cheaper and less stressful. This growth has led scholars to carry out various types of research with the aim of discovering the characteristics of discourse in mediation. As a result, theories based on systematic analyses of mediation dialogues are appearing, which offer novel insights and valuable data. As many research works have shown, argumentation deserves a particular attention in mediation since mediators must, at the same time, make sure that disputants effectively argue to reach an agreement, and preserve their neutral role.

The increasing visibility of mediation and the growing number of investigations on the topic offer new opportunities to provide mediation professionals with support tools which the process lacks when compared with other dispute resolution procedures such as traditional litigation. The research reported here therefore proposes to advance theoretical knowledge of the dialogical and argumentative activity in mediation in order to deliver practical applications to support mediation training.

To achieve this goal, this work relies on argumentation theory applied to discourse studies and computational models, namely Inference Anchoring Theory (IAT). This framework has already been successfully applied to other dialogical contexts (radio debates) in order to study argumentation. It has been shown that its main advantages are its flexibility regarding annotation schemes and its ability to elicit non-obvious argumentative structures which can then be easily modelled thanks to detailed analyses of dialogical

dynamics (see e.g. (Budzynska et al., 2016)).

As a first step, a close analysis of transcripts of mediation sessions with IAT allows exploring the link between dialogical and argumentative dynamics, and revealing their patterns. Once modelled, these patterns are used to define rules which are then specified in the form of a dialogue game: the Mediation Dialogue Game (MDG). MDG rules are defined after in-depth empirical studies and statistical analyses. They reflect therefore mediation participants' actual behaviours; they can also be regarded as normative rules since any mediation dialogue can be compared with MDG rules. The game can also be played in conversational support systems to enable trainee-mediators to practice their skills and techniques in a computational environment replicating mediation dialogues, in the same way as role-plays, the basis of mediation training. To verify the quality and reliability of MDG, actual mediation dialogues are compared with the rules of the game, thus leading to a revision of some rules for a more accurate dialogue protocol. It is then shown that the revised version of the game, MDG$'$, fairly matches mediation interactions, and can be further developed as a fully-fledged tool for mediation training. The game represents therefore an empirically based normative tool which finds practical applications.

The evaluation process reveals some limitations of MDG$'$. Meta-discourse, in particular, plays a major role in mediation dialogues which the game fails to capture. The necessity for potential users to use meta-discursive moves in MDG$'$ in order to have a greater impact on the direction and content of the dialogues is hence highlighted, and a method for the analysis of the role and function of meta-discourse in mediation is proposed. This first-ever study of meta-discourse in mediation dialogues represents the foundation of a wider account of mediation discursive and argumentative characteristics.

As a conclusion, the research presented here stands as a novel approach of argumentative dialogues in mediation and explores the relationship between dialogical dynamics and meta-discourse. It relies on in-depth investigations of a corpus of mediation dialogues in order to explain the link between dialogical behaviours and argumentative dynamics. These theoretical findings are then used to develop a practical tool intended for mediation

training[1]. This work brings new findings in argumentation theory and discourse studies, advancing theoretical knowledge and creating an opportunity for the support of mediators' training in a context of growing interest in alternative dispute resolution procedures.

[1]Though the aim of this work is to provide a tool for mediation training, the different contributions of this work also represent a first step towards the development of a tool which mediators could use during sessions.

Chapter 1

Introduction

1.1 The rise of mediation as a conflict resolution process

Dispute mediation is an Alternative Dispute Resolution (ADR) procedure which aims at bringing together conflicting parties who need and want to resolve a dispute but are not able to do so without help. To guide them through the resolution of their conflict, professional mediators act as third neutrals whose goal is to make sure the parties manage to have a reasonable and peaceful discussion. Mediation is often used as an alternative to traditional litigation for civil cases such as divorces, child custodies or discrepancies between neighbours to relieve overcrowded courts. The reason for its popularity can be found in the cost-effective and time-effective character of mediation compared to traditional litigation (Mnookin, 1998). For instance, mediation appears to be 60% cheaper, allowing disputants to save over €7,500 on average[1]. As a consequence, in some countries mediation is now mandatory for some disputes such as divorces – in the UK, some states in the US, Norway, etc. – , and the European Union has issued two directives in 2008[2] and 2013[3] to foster the implementation of mediation in the landscape of dispute resolution processes. The BBC TWO channel has also created in 2016 a reality-TV programme - *Mr. V Mrs.: Call the mediator* - in which mediators belonging to the National

[1] europarl.europa.eu/RegData/etudes/etudes/join/2014/493042/IPOL-JURI_ET%282014%29493042_EN.pdf

[2] eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0052&from

[3] eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013L0011

Family Mediation service[4] and disputants share their experience. The general public's appetite for this TV programme further testifies to the popularity of mediation.

The rapid expansion of mediation, along with the internationalisation of disputes – because of the increasing number of on-line purchases, or even of trans-border relationships for commerce or between couples – has led to the development of Online Dispute Resolution (ODR) (see e.g. (Rule and Sen, 2015)). ODR corresponds with the procedures of dispute resolution which are brought online, via video-conferences, email exchanges or dedicated platforms in websites to deal with potential issues arising from contested transactions. The transposition of mediation online testifies to the importance of the procedure worldwide, therefore increasing the number of mediations and, by extension, of mediation professionals. The development of ODR services also shows that advances in the computational area make it possible to develop tools to support mediation.

This increasing popularity has also caught the attention of scholars who have strived to understand and describe this process from different points of view. While some works of research explain the mediating process and mediation techniques in details (see e.g. (Kovach, 2005; Wall et al., 2011)), others focus on precise aspects of the discussions in mediation sessions. The confidentiality and emotional load of the process, as well as the specific role of mediators who must ensure a resolution of the conflict whilst staying neutral, give the discourse in mediation its own and distinctive features.

1.2 Motivations

Several studies have extended knowledge in mediation, in which two lines of research can be distinguished; whereas some studies – often published in journals dedicated to conflict resolution procedures (see e.g. (Wall and Chan-Serafin, 2014; Herrman et al., 2001)) – focus on the process itself and the mediators' skills, others are rather interested in the discursive activity in mediation, and its pragmatic or argumentative facets (see for instance (Greco Morasso, 2011; Jacobs, 2002)). Both types of research are necessary to both improve our knowledge of mediation and bring new insights about to how to support the practice and its growth. The goal of the present work is to widen knowledge in the

[4] nfm.org.uk

argumentative and dialogical aspects of mediation; it will therefore rely on the two types of studies, but will pay a greater attention to works of research focusing on mediation discourse, such as the ones introduced below.

Jacobs and Aakhus (2002a) have shown that mediators must facilitate the dialogue between disputants, and summarise, clarify and give an orderly shape to the discussion. But, Greco Morasso (2011) demonstrates that, although disputants engage in a discussion to resolve a conflict, the mediator is actually the one who makes it happen: a mediator must stay neutral and should not take position regarding either disputant, but she is at the same time in charge of their discussion. In other words, although disputants are responsible for the outcome of the mediation, the mediator plays a major role in the argumentative process; as a consequence, the study of the argumentative activity in mediation must take into account the mediators' moves and the parties' moves in a similar manner. Most works of research in the area have relied on empirical analyses of dialogues in mediation to identify and describe speakers' verbal and argumentative behaviours and strategies (see e.g. Greco Morasso (2011)). In spite of their unquestionable value, these studies have limited themselves to the description of discourse and barely explain the dialogical dynamics and their link with the overall argument structure of the discussions. However, knowing why a speaker makes such or such move following her interlocutor's such or such other move, regardless of the exact content of the moves (whether they are about a noisy neighbour or a disrespectful boss), is a crucial parameter in the understanding of mediation discussions as a whole. As a consequence, the present work proposes in-depth analyses of argument structures in mediation via the exploration of dialogical moves, with the aim of discovering the dynamics of mediation discourse.

Furthermore, despite an increasing popularity, and unlike traditional litigation, mediation has not much benefitted from technological advances to make the process easier and more effective, except for the development of ODR. It is however crucial to provide the general public and mediators with quality services to ensure a steady and efficient growth of the process. A first step in this direction is to support mediators' training. Training for mediators mainly consists in role-plays, where trainees must practice their skills with the help of experienced mediators by dealing with mock – though inspired by real – dispute

cases. These role-plays are usually video-recorded so that participants can later on reflect on their performance. Despite the importance of the presence of experienced mediators for the guidance they provide to mediators-to-be, one disadvantage of this training process is that it cannot be done remotely. For example, trainees cannot practice their skills on their own and must physically be with their tutors. Proposing a computational tool which simulates the principle of role-plays, namely making available a dispute scenario on a piece of software for the trainee to implement her skills and techniques, would allow removing this downside, and represents the core goal of the present study. In-depths analyses of mediation discourse will help achieve this aim; the detailed modelling of dialogical dynamics in mediation can be used to design a computational tool in which such dynamics are replicated. Computer science fields have been interested in dialogue games because they allow replicating dialogues in a computational environment, in which human players can engage in the conversation with other human or virtual agents. Systems playing such games have been used in several contexts, including public deliberation, trials and education (see e.g. (Moore and Hobbes, 1996)). Designing such a game for mediation provides a novel opportunity for this ever-growing practice.

1.3 Challenges

The two main goals presented above, namely accounting for mediation dialogical and argumentative dynamics and modelling them to be able to deliver a tool for mediators' training, come with inherent challenges.

First of all, the confidentiality of the mediation process is synonymous to scarcity of materials to study. The understandable reluctance of mediators and participants to let someone assist or record their discussions makes it hard to obtain reliable data to study. Detailed analyses of argumentation, yet, must rely on transcripts of – mock or genuine – mediation sessions. As a consequence, gathering transcripts of mediation will represent a necessary first, yet challenging, step. It will be shown that resources for the study of mediation discourse can be obtained through several means which all come with advantages and drawbacks. For instance, using already published material, such as excerpts presented by academics in articles is an easy way of obtaining reliable and usable

data to study. Another track to follow, is to search transcripts online; however, their source may be anonymous, which can be an issue with respect to the reliability of their contents.

A second major challenge is to have an adequate theoretical framework to carry out analyses. This framework must allow the analysis of discourse dynamics of dialogical argumentation. Several theories exist which handle discourse analyses; however, few allow reporting on argumentation in dialogical contexts. Furthermore, its application to mediation discourse will have to be both simple and informative; that is, the annotation scheme must allow a clear distinction between schemes to facilitate the task, but it also has to be accurate and detailed enough to carry out as fine-grained analyses as possible.

Another challenge which comes along with the goal of the proposed study, is to find a way to, first of all, model the major characteristics of mediation discourse, and to make this modelling usable in a software environment which will allow replicating mediation discussions. Therefore, the modelling will need to be both expressive enough to grasp the details and complexity of mediation dynamics and computationally usable.

More generally, the complexity of mediation dialogues itself may well represent the major challenge. Most studies on dialogues have limited themselves to two-parties argumentation. In mediation, three speakers – at least – are involved in a discussion; moreover, although their general goal is identical – resolving a conflict – they do not all have the same roles. On the one hand, the parties, by definition, have opposite views on the issue at stake and try to convince their opponent[5] to accept their solution. On the other hand, mediators must lead the disputants towards a solution which will satisfy them both, whilst staying neutral. For many authors, mediation is essentially a negotiation which parties undertake under the impulse of the mediator; but, as Jacobs and Aakhus (2002b) have shown, mediation discussions are a mixture of several types of dialogues. Furthermore, emotions tend to take a large place in discussions since parties are usually angry at each other and very often systematically reject their opponent's proposal. In order to ensure a quick, reasonable resolution, mediators must therefore intervene in the parties' discussion, and at the same time preserve their impartiality and not take a stand on the disputants' positions. Dialogues are therefore clearly argumentative and led by the medi-

[5]Throughout this work, when the term 'proponent' is used, it refers to the speaker (e.g. the person who asserts a certain claim) while the term 'opponent' refers to the hearer.

ators' interventions whenever the discussion leads nowhere. Some research works have already brought advances on the understanding of mediation discourse and the speakers' strategies (see e.g. (Greco Morasso, 2008; Jacobs, 2002) etc.). They will provide the necessary key knowledge about mediation argumentative discourse. The work presented here provides detailed accounts of mediation dialogical dynamics which previous research hitherto have not provided.

1.4 Outline

The goal of the present work is therefore to provide a in-depth account of dialogical and argumentative dynamics in mediation discourse in order to be able to deliver a practical tool for mediators' training. The several steps towards this aim are reported as follows.

Chapter 2 provides an overview of the literature on the topics of mediation, discourse analyses and computational systems for argumentation, which will bring the necessary knowledge for tackling mediation discourse and the possibilities to computationally support the practice. In Chapter 3, several analytical frameworks for the study of dialogical argumentation are contrasted, with the aim of identifying one which will be detailed enough to grasp the complexity of mediation dialogues. Such a framework is then applied to an argumentative discourse genre – debates – in order to test its accuracy and stability, before applying it to mediation discourse in Chapter 4. This chapter is devoted to annotations of mediation dialogues in order to discover the link between dialogical dynamics and argumentative structure of particular aspects of mediation conversations, such as the beginning of discussions and mediators' strategies identified by related studies introduced in Chapter 2. The resulting analyses are then modelled and used in Chapter 5 to define the rules of a dialogue protocol taking into account the most important characteristics of mediation discourse. The following Chapter 6 contrasts the dialogue game with genuine mediation dialogues in order to reveal its weaknesses and propose an improved version of the game, which is then implemented in a system which allows replicating mediation dialogues into a computational environment. Both versions of the game are presented in the study. The former version shows that empirical methods are necessary to develop the dialogue game, while in Chapter 6, the dialogue game is used as a normative model in

order to describe real mediation dialogues. In addition, the evaluation task leads to the discovery of additional characteristics of mediation discourse which are tackled in Chapter 7, which proposes a study of meta-discourse in mediation, with the aim of advancing knowledge in mediation and argumentative talk in general. Chapter 8 concludes the study and proposes some directions for future work.

1.5 Published work

The different chapters composing the present study are mainly extended and improved versions of already published research works. Here is the list of the published articles which have been the foundation of the present study:

- Chapter 3 – Identification and application of a theoretical framework for the analysis of argumentative dialogues
  - K. Budzynska, M. Janier, C. Reed, P. Saint-Dizier, M. Stede, and O. Yaskorska. A model for processing illocutionary structures and argumentation in debates. In *Proceedings of the 9th edition of the Language Resources and Evaluation Conference (LREC)*, 2014. (Budzynska et al., 2014b)
  - K. Budzynska, M. Janier, J. Kang, C. Reed, P. Saint-Dizier, M. Stede, and O. Yaskorska. Towards argument mining from dialogue. In *Computational Models of Argument (COMMA)*, 2014. (Budzynska et al., 2014a)
  - K. Budzynska, M. Janier, J. Kang, C. Reed, P. Saint-Dizier, M. Stede, O. Yaskorska, and B. Konat. Automatically identifying transitions between locutions in dialogue. In *European Conference on Argumentation (ECA)*, 2015 (Budzynska et al., 2015)
  - O. Yaskorska and M. Janier. Applying Inference Anchoring Theory for the analysis of dialogue structure in debate. In *European Conference on Argumentation (ECA)*, 2015. (Yaskorska and Janier, 2015)
  - K. Budzynska, M. Janier, C. Reed and P. Saint-Dizier. Theoretical foundations for illocutionary structure parsing, *Argument and Computation*, IOS Press, vol. 7, no. 1, pp. 91-108 (Budzynska et al., 2016)

  - C. Reed, K. Budzynska, R. Duthie, M. Janier, B. Konat, J. Lawrence, A. Pease, and M. Snaith. The Argument Web: An online ecosystem of tools, systems and services for argumentation. *Philosophy & Technology*, 2017, to appear. (Reed et al., 2017)

- Chapter 4 – Introduction of web-based tools to annotate and store excerpts of argumentative dialogues, construction of a corpus of mediation dialogues, and detailed analyses of mediation discourse

  - M. Janier, J. Lawrence, and C. Reed. OVA+: An argument analysis interface. In *Computational Models of Argument (COMMA)*, 2014. (Janier et al., 2014b)
  - J. Lawrence, M. Janier, and C. Reed. Working with open argument corpora. In *European Conference on Argumentation (ECA)*, 2015. (Lawrence et al., 2015)
  - M. Janier and C. Reed. Corpus resources for dispute mediation discourse. In *Language Resources and Evaluation Conference (LREC)*, 2016. (Janier and Reed, 2016)
  - M. Janier and C. Reed. Towards a theory of close analysis for dispute mediation discourse. *Argumentation*, 31(1):45–82, 2017. (Janier and Reed, 2017b)

- Chapter 5 – Definition of a dialogue protocol for dispute mediation

  - M. Janier, M. Aakhus, K. Budzynska, and C. Reed. Games mediators play: Empirical methods for deriving dialogue structure. In *MET-ARG workshop*, December 2014. (Janier et al., 2014a)
  - M. Janier, M. Aakhus, K. Budzynska, and C. Reed. modelling argumentative activity in mediation with Inference Anchoring Theory: The case of impasse. In *European Conference on Argumentation (ECA)*, 2015. (Janier et al., 2015)

- Chapter 6 – Implementation of a dialogue game for dispute mediation in a conversational support system

  - M. Janier, M. Snaith, K. Budzynska, J. Lawrence, and C. Reed. A system

for dispute mediation: The Mediation Dialogue Game. In *Proceedings of COMMA*, 2016. (Janier et al., 2016)

- Chapter 7 – Towards an account of meta-discourse in dispute mediation
  - M. Janier and C. Reed. *I didn't say that!*: Uses of SAY in mediation discourse. *Discourse Studies*, 19(5), 2017. (Janier and Reed, 2017a)

Chapter 2

Literature review

As introduced in Chapter 1, the goal of the present study is to explore the dialogical dynamics in dispute mediation to provide an account of the relationship between dialogical and argumentative activity, with the final aim of delivering a technological tool for supporting mediation practice. This study therefore needs to rely on four research domains; first, mediation practice (and conflict resolution in general) to understand the basic characteristics and procedures of the mediation process. Second, discourse analysis to describe and analyse the interactions in mediation. Third, argumentation theory to explain the argumentative functions of discourse. Finally, the other important domain of research which can help achieve this goal is computer science because of the opportunities it offers for the development of technological tools and its recent close link to argumentation theory. The following sections propose an overview of the literature in these sometimes interwoven areas.

2.1 Mediation

Dispute mediation is an Alternative Dispute Resolution (ADR) practice; it is said to be *alternative* to distinguish it from the most known, common and traditional practice of litigation such as trials in court. Other ADR practices exist, such as arbitration or negoti-

ation[1] , which have common characteristics: they are usually cheaper, quicker and more convenient ways to resolve a dispute than traditional litigation. These are probably the reasons why these practices, and mediation in particular, tend to attract more and more people who want their case resolved.

Mediation has therefore experienced a growing popularity, evidenced by the increasing number of disputes mediated in Western countries: mediation is mandatory for some disputes, generally divorces, in UK, Norway, or many states in the US, and litigation is happening only if the parties have not been able to reach an agreement through mediation. Moreover, the European Union has issued two directives to promote mediation[2] and ADR (Alternative Dispute Resolution) in general[3].The general public's interest in mediation is another evidence of mediation's popularity: as an example, in 2016, the BBC aired a reality-TV programme - *Mr v Mrs: Call the mediator* - in which mediators and disputants share their experiences[4].

Dispute mediation deals with a large variety of cases, family mediation being the most common. In the present work, only civil case mediations are considered and the examples on which the study relies are analysed without distinguishing the context in which they occur (i.e. workplace, divorce or child custody, for example). A major difference between mediation and other conflict resolution processes is that the agreement is not necessarily legally bound but can be enforced (Mnookin, 1998); it is, overall, a win-win process (Greco Morasso, 2008), whereas arbitration, for instance, consists in involving a third party who, contrary to a mediator, will impose a decision which is legally binding (Maleson Spencer and Zammit, 1976).

The steady growth of mediation has attracted research scholars into as various domains as communication studies, argumentation theory, conflict resolution, sociology or psychology. Although the studies carried out have different focuses (e.g. communica-

[1]Negotiation is an ADR through which people try to find a compromise. Advocates can help disputants who go through negotiation. The main difference between mediation and negotiation is that the negotiation procedure is used to find a compromise (for material issues such as money, mathematical concepts are involved, e.g. to find the Best Alternative to a Negotiated Agreement) while mediation is used to ease communication and find a solution which can be exterior to the initial position of the disputants.

[2]eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0052&from=FR

[3]eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013L0011

[4]bbc.co.uk/programmes/b07hnn0b

tive strategies in communication studies, argumentative strategies in argumentation theory, mediators skills and competence in conflict resolution studies, etc.) they all provide crucial information about what dispute mediation is as a whole. The following sections will give an overview of the literature concerned with dispute mediation, as well as the domains which will help in tackling the challenges posed by the research question introduced in Chapter 1.

2.1.1 What is dispute mediation?

Dispute mediation is a practice which helps conflicting parties reach an agreement through the intervention of one – or sometimes two – third neutral(s): the mediator. A mediator's role is to make sure the disputants have the most reasonable and efficient discussion in order to promptly come to the resolution of their conflict. This resolution must equally satisfy the parties, who are the ones who finally decide on their case (Greco Morasso, 2010). There are different approaches to mediation (transformative, directive, facilitative, etc.); no mediator follows the exact same procedures (for example, some mediators insist on involving the disputants' lawyers)(Mnookin, 1998), and, above all, the problems tackled in dispute mediation can occur in different contexts: family, labour world, communities, etc. Moreover the shape and content of any discussion depend on the context in which it occurs. The reasons why people are disputing can be various: e.g. divorcing couples who do not agree on their child custody; a buyer who is searching reparation after the acquisition of a damaged good; an employee who wants a pay raise which the employer does not want to grant, etc. These issues are seen in mediation as the point of departure of the dispute but not necessarily as the main issue. According to mediators as well as empirical studies, all conflicts have the same root, namely problems of communication (Greco Morasso, 2011, 2010). That is, miscommunication is at the heart of the disputes. Conflicts of opinions, indeed, are the reasons why people are involved in a dispute. However, miscommunication between people makes the dispute worse (e.g. when they are unable to express their opinion or unwilling to acknowledge their co-disputant's opinion). Moreover, such conflicts of opinions are often the result of a miscommunication (e.g, when people use the same term but give it a different meaning); pointing out prob-

lems of communication and trying to resolve them is what most mediations are about. As a consequence, restoring communication is the mediators' main role, which is why their place in the discussion is so crucial and has been the focus of several research works, as we will see in Section 2.4. Mediators put an emphasis on the issue of miscommunication in disputes in which parties have a relationship (be it personal or professional) and need or want to preserve it (Greco Morasso, 2011, 2010). Repairing a damaged relationship through better communication between discussants is therefore most of the mediation sessions' focus. Not all disputants, however, need to preserve their relationship; for instance, an unhappy customer after an on-line transaction will not necessarily want to keep in touch with the seller afterwards. Mediation is, in any case, about making communication possible and easier. Eisen (1998) explains that the outcome of a mediation is not the only thing which matters: getting to an agreement is indeed important, however, mediation is above all about easing, fostering and healing communication between conflicting parties. Problems of communication are (probably) one of the most important difficulties in a dispute. At some point, mediators may want the parties to clarify their standpoints (Jacobs and Aakhus, 2002a). Indeed, misunderstanding is very often the origin of a difference of opinion e.g. when people use the same word but give it a different meaning. In the context of mediation, the *clarification of misunderstandings* is usually concerned with the disputants' relationship (Greco Morasso, 2011).

The principle of neutrality is the major difference between mediation and other conflict resolution processes. Mediators cannot rule on a case or take a position for or against a party. Their role is to smoothly lead disputants towards a solution by offering a communication space where the discussion will be effective and efficient. Studies have shown that mediators' neutrality has less to do with the final solution of the conflict than with the developments to get to the solution: they will not advocate for a particular solution, but they can propose ways to get to a solution (Greco Morasso, 2011; Jacobs and Aakhus, 2002b; Jacobs, 2002).

One of the biggest challenges of mediation is its high emotional load: conflicting parties are very often close people (families, neighbours, co-workers) and their relationship suffers from the dispute, therefore emotions take a large place in the discussion. Me-

diation is a convenient choice for people who do not want to damage their relationship any further, and mediators tend emphasise the importance of the relationship between the disputants during the discussions. The inherent emotional character of a dispute makes it hard to have a sound and reasonable discussion because parties are generally angry or disappointed. Here lies the mediators' role: they make sure that the parties can talk to each other and quickly manage to find a solution to their conflict, preferably before the dispute escalates to the point where a third neutral is helpless and a judge has to decide on a solution, which will rarely satisfy both parties. Mediators must make sure that emotions do not hinder the mediation process, but they do not try to prevent them because emotions and feelings are necessary to know what really matters to disputants (Greco Morasso, 2011).

This section has provided an overview of what dispute mediation is, which is useful to understand the practice, and the mediator's role in particular. The following section focuses on the mediation process and its procedural steps.

2.1.2 The mediation process

The goal here is to go through the different steps of a mediation session and give the necessary information about what mediation sessions consist of; this is helpful to understand some characteristics of the practice. Table 2.1 presents the summary of the stages in a typical mediation as it is given by Kovach (2005), and reported by Greco Morasso (2011). As the authors remark, the stages should not be thought of as being linear since some stages may appear several times in different moments.

1	Preliminary arrangements
2	Mediator's introduction
3	Opening remarks / statements by parties
4	Venting (optional)
5	Information gathering
6	Issue and interests identification
7	Agenda setting (optional)
8	Caucus (optional)
9	Option generation
10	Reality testing (optional)
11	Bargaining and negotiation
12	Agreement
13	Closure

Table 2.1: Stages of the mediation process, from (Kovach, 2005, p 307)

The first stage is not part of the mediation process itself, it rather concerns the steps to take as a preparation of the mediation. It includes, for example, the mediator explaining the fees to the parties or signing a contract. In stage 2, mediators have to explain and describe the mediation principles and rules, and how the session will unfold. Then parties give their points of view and feelings on the dispute (stage 3 and 4). The mediator then summarises their position (stage 5) and usually puts an emphasis on the parties' interests (stage 6). Following this, the mediator can propose an agenda for the issues to be tackled (stage 7). Caucuses (stage 8) can occur if the parties or the mediator think that individual discussions will make the definition of the issue easier. At stage 9, parties and mediator explore the possible solutions to resolve the conflict; they then check how feasible and reasonable the options are (stage 10), and debate (or negotiate) on these solutions (stage 11) to find a compromise. Stage 12 marks the resolution of the dispute: an agreement is reached. The last stage (13) usually serves to summarise the agreement and foresee the possible steps after the mediation process. When looking at Table 2.1, except in stage 2, the mediators' role is not a priori visible. This is precisely why they are called third-neutrals: they are not the protagonists of any of the stages. But we have seen that they must make sure that the discussants eventually manage reach the final agreement. They therefore have a background task which is to lead the disputants through each stage. At any time, the discussion is likely to derail because of the unreasonableness of parties. This is when the mediator's role is the most evident: whenever they detect that the dis-

cussion is about to lead to an impasse, hindering its progress, they must react and put the parties back on track (see also Section 2.4.1). Aakhus (2007) refers to the techniques which redesign the discussion and shape the interactions as *communication design*. Mediators are thus seen as designers who are in charge of the shape, structure and conditions of the discussion. They therefore play a subtle role, ensured by specific dialogical and argumentative strategies, as we will see in Section 2.4.2.

In this Section an overview of the principles of mediation and its process has been given, and has provided key knowledge on what mediation sessions look like. One of the first goals of the present study is to account for a deep analysis of discourse in mediation, which the above section will help apprehend. The next section tackles a research domain which will provide another necessary knowledge: discourse studies.

2.2 Discourse studies and discourse analysis

Discourse analysis frameworks are theories used to describe and explain written and spoken discourse in any natural (real-life) context. This section is an overview of the major works which have provided valuable insights about what must be accounted for in discourse studies.

2.2.1 Critical Discourse Analysis (CDA)

Critical Discourse Analysis (CDA) is a framework which not only describes discourse but also aims at explaining the psycho-sociological effects of discourse by showing, via empirical data analyses, how discourse serves the ideological interests of participants (see e.g. (Blommaert and Bulcaen, 2000; Kress, 1990; Fairclough, 2013; van Dijk, 1993; Sheyholislami, 2001)). In CDA, the concept of power thus takes a major place, and most CDA studies are therefore interested in institutional discourse and especially political discourse. CDA therefore pays special attention to vocabulary, grammar and text structure to highlight cases of dominance, discrimination and control in social interactions (Blommaert and Bulcaen, 2000). The main assumption of CDA is that language can never been conceived of as neutral: participants in a discourse always express a particular stance

towards what they talk about (Kress, 1990). That is why, speech acts are a discourse feature which is systematically explored in CDA. As we will see in Section 2.2.2, speech acts indeed provide a clear indication of what speakers (or writers) attempt to realise in discourse.

As a pioneer in the area, Fairclough conceives discourse according to three dimensions: (i) the text dimension, in which linguistic features, text structure and vocabulary are systematically analysed; (ii) the discourse-as-discursive-practice dimension which explores the link between a discourse and its context; and (iii) the discourse-as-social-practice dimension in which attention is given to how a text (written or spoken) is presented in specific contexts (Fairclough, 1992).

Despite a recent trend in the domain which advocates for the taking into account of argumentation theories in discourse studies (see in particular (Fairclough et al., 2011)), CDA's primary goal is to reveal relations of power and dominance in discourse (van Dijk, 1993). These concepts are not at the heart of the current investigation, especially since mediators' strategies aim at alleviating unreasonable behaviours and preserving their neutrality. Moreover, the critical aspect of the methodology is not what a target in the present study. The goal here indeed is to reveal argumentative and dialogical dynamics in mediation, without intending to explain the speakers' ideology or relating them to a wider social context. As a consequence, CDA does not stand as an ideal framework for the study of argumentative strategies in mediation discourse, even though it puts a light on the necessity of in-depth analyses for understanding discourse and the practice in which it occurs. It therefore provides valuable insights about what must be accounted for in specific discursive contexts.

2.2.2 Speech Act Theory (SAT)

While CDA is anchored in social and psychological aspects of discourse, Speech Act Theory (SAT) (Austin, 1975; Searle, 1969) has a more philosophical approach to discourse. In Speech Act Theory, utterances (spoken or written) are thought to be propositional contents to which a force (the illocutionary force) is attached. This force represents the intention (or position) of the utterer with regard to the propositional content. She can claim,

question, challenge, reject, etc. Speech Act Theory therefore offers a valuable framework in which utterances can be described and analysed according to their force. In SAT, every utterance has the power to change the world as much as any other actions. For example if I *declare* war, then, there is a war, if I *inform* you of something, the world changes as well because it adds information to your knowledge.

Searle and Vanderveken (1985) classify illocutionary forces in five categories: assertives, commissives, directives, declaratives and expressives. These categories allow a first general distinction between locutors' communicative intentions. Knowing what the speakers' intentions are is crucial for understanding a particular discourse: if a speaker-writer claims something (assertive verb) this means that he (normally) believes what he says; if he uses an expressive verb (e.g. to apologise), he shows his attitude, rather than opinion, towards the propositional content.

An approach which makes extensive use of Speech Act Theory is pragma-dialectics (van Eemeren and Houtlosser, 2003). In this theory, the analysis of discourse relies on a normative framework in which the speakers' communicative intentions must always be analysed. More details on the pragma-dialectical approach of argumentation will be given in Section 2.3.3 which provides an overview of argumentation theories interested in dialogues.

A drawback of SAT is that it does not capture the interaction between utterances. The framework does not tell us anything about the discourse resulting from exchanges of utterances, which is crucial to understand the dialogues. Moreover, as argued by van Eemeren and Grootendorst (1982), despite the great value of SAT as a theoretical framework for studying language use, it is inadequate for the description of argumentation.

2.2.3 Rhetorical Structure Theory (RST)

Contrary to SAT or CDA, Rhetorical Structure Theory (RST) is a descriptive theory which aims at eliciting rhetorical relations in written texts (Mann and Thompson, 1988). RST allows revealing the structure of natural language texts by showing the different relations between text portions. A wide range of such relations have been identified (e.g. justification, elaboration, restatement, etc.) which allow a comprehensive analysis of the hier-

archical structure of texts. RST aims at revealing the structure of natural language texts by showing the different relations between text portions (Mann and Thompson, 1988). In RST, the writer's intention, i.e. what he intends to rhetorically achieve in his discourse, must be taken into account.

Although RST central idea of functional relations to describe discourse structure subsumes taking into account the writers' rhetorical aims, the model is not interested in speech acts (or illocutionary forces), and misses the opportunity to describe their intentions. RST, primarily designed for written texts, has been expanded to be applied to dialogues. The model indeed fails to capture the structure of dialogues. As a response to this weakness, Stent (2000) has modified some RST guidelines and added annotation schemes which allow showing the hierarchical rhetorical structure between argumentative acts in task-oriented dialogues. Task-oriented dialogues are dialogues in which speakers mutually decide on a task to be achieved and the best way to achieve it. They encompass discussions such as why, where, how and when to fix a broken electrical line or to send an ambulance. RST has been applied to such dialogues in order to discover whether some of the speakers' contributions directly serve the realisation of a task or only serve their rhetorical goal. RST for dialogues is therefore a model in which the rhetorical relationship between dialogical moves can be described. For example, the tag *question-answer* has been added to the set of relations to describe a phenomenon which does not (usually) appear in written texts but is very common in dialogues, namely asking questions and responding to them. A drawback of the framework, however, is the way it conceives minimal units (from capital letters to punctuation marks). Most of all, despite some relations identified by RST and which could be related to argumentative dynamics (such as *justification* or *elaboration*), the model is not particularly useful for in-depth exploration of such dynamics. RST and its extension to dialogues are not interested in argumentation and counter-argumentation. Consequently they do not represent an adequate framework for the study of mediation, a highly argumentative type of discourse.

2.3 Argumentation theory

While discourse analysis aims at describing forms, practices, patterns, structures and functions of everyday discourse through an empirical methodology, argumentation theory has a more restricted scope: argumentative practice. Argumentation theory aims at analysing, describing and evaluating argumentation. Consequently, argumentation theory relies not only on descriptive frameworks, as discourse analysis does, but also on normative standards: most argumentation theories strive to describe and explain argumentative discourse by comparing it with some standard of ideal and reasonable discussion. Most importantly, far from just relying on argumentation from philosophy or logics, argumentation theory takes into account a large variety of linguistic features such as syntax, semantics and pragmatics within a particular context, to show and explain how and when arguments are produced, even though they may be implicit. Argumentation theory obviously must rely on discourse analysis since the study of natural-language argumentation necessarily takes place in discursive contexts. Discourse analysis, however, is not primarily interested in argumentation but, as van Rees summarises (van Rees, 2007), discourse analysis and argumentation theory, though quite distinct in their methods and goals, need each other: discourse analysis provides empirical accounts of discourse, and argumentation theory provides theoretical frameworks in which discourse can be interpreted. Van Rees argues that argumentation theory would highly benefit from the detailed analyses provided by discourse analyses, while discourse analysis can take advantage of argumentation theory which highlights argumentative (rhetorical) strategies.

2.3.1 What is an argument?

A first point to be highlighted when it comes to argumentation theory is the ambiguity of the word *argument* in English.O'Keefe (1977) distinguishes between argument$_1$, which refers to the reasons given for or against a point of view, and argument$_2$ which has to be understood as equivalent to dispute[5]. Argumentation theory offers a framework in which people trying to resolve conflicts of opinion (i.e. argument$_2$) and critical reasoning (i.e.

[5]Throughout this work, the term "argument" is used as equivalent to "argument$_1$ while "argumentation" refers to the process of arguing. To avoid ambiguity, the term "dispute" is used as equivalent to argument$_2$.

argument$_1$) have been extensively studied.

In his major work, Toulmin (1958) identified the six components of an argument$_1$:

- the claim is the conclusion of an argument
- the data (or grounds) are the premise(s) of the argument; it supports the claim
- the warrant is a statement which acts as a guarantee of the link between the data and the claim
- the backing is a statement which must prove that the warrant is credible
- the rebuttal is a statement which provides restrictions to the claim
- the qualifier is a word or phrase which provides the degree of certainty of the claim

The diagram is usually represented as in Figure 2.1. Only the first three elements of the diagrams are mandatory to create an argument, the others are not required.

Figure 2.1: Toulmin's diagram

The following sections provide an overview of the most renowned argumentation theories, in which the interrelations between arguments$_1$ and arguments$_2$ are the core interest.

2.3.2 Argumentation schemes

The notion of *argumentation schemes* was introduced to refer to the structure of everyday arguments. Walton was the first expert who has characterised in details the link between premises and conclusions of arguments, and has been a pioneer in the identification and

definition of a large set of different types of arguments (Walton, 1996). In most argumentation theories, arguments are considered as valid when the conclusion naturally follows from the premise(s). Each argument therefore possesses a scheme which allows discovering its premises and conclusion, and a set of critical questions to evaluate and point to its possible weaknesses. As an example, an *argument from authority* takes the following form:

E is a reliable authority in the domain S.

A is a proposition contained in S.

E asserts that A.

Therefore, A.

The critical questions attached, which allow verifying the strength of the argument, are the following:

Is E a genuine authority?

Did E really assert A?

Is E an authority in the right field?

Argumentation schemes are therefore a useful method to analyse and reconstruct arguments, including detecting enthymemes (i.e. missing premisses). As more studies on argumentation, and more precisely in natural language, have been carried out, more and more argument types have been identified (e.g. (Walton et al., 2008; Walton and Reed, 2005)). The rich taxonomy of argumentation schemes makes it possible to accurately label the simple link between premises and conclusion, and is helpful to detect bad arguments (i.e. fallacies).

2.3.3 Argumentation in dialogues

A growing body of work has also been interested in explaining discourse functions in argumentative dialogues. This section presents some of the major frameworks which offer detailed analyses of discourse and comments on their respective suitability to the challenge of studying argumentation in mediation dialogues.

Theoretically, an arguer effectively fulfils her aims (i.e. to convince) only if all counter-arguments to her standpoint are defeated or if no counter-argument is attacking the stand-

point (see e.g. (Walton, 1996; van Eemeren and Houtlosser, 2003)); that is, a speaker has convinced her opponent when she has managed to support her claims and no counter-argument attacks them. Counter-argumentation is principally performed in dialogical contexts, in which speakers try to persuade their opponents. Argumentation therefore presents its own characteristics when people are involved in dialogues. More and more research focuses on dialogical argumentation, and must face challenges which do not exist in monological contexts because, in a dialogue, speakers constantly use their interlocutors' contributions: when they answer, refute, argue, etc. In addition, studying dialogical argumentation requires determining who the proponent of a claim is, who the opponent is, whether the opponent attacks the proponent's claim or another element of her argument (e.g. the warrant), whether the proponent actually answers the opponent's doubts (i.e. challenges, or attacks)[6]. Most importantly, it requires detecting the conflict between proponent and opponent: how can we know that a claim is attacked by an opponent if she does not explicitly say so (for instance by saying "I disagree with your claim.")? Argumentation theory models must therefore make a distinction between monological and dialogical contexts.

Dialogue types Five main argumentative dialogues have been extensively studied (see in particular (Walton, 2007)): information seeking (when a person asks another person a piece of information which she is supposed to have), persuasion (when someone tries to convince someone else to adopt her standpoint), negotiation (when people try to find the best way to share something; this can be objects, such as money, or more abstract concepts, such as time), inquiry (when two people try to mutually find an answer or information), and deliberation (when two people have different opinions on how to reach a solution). Argumentative dialogues are studied in specific discursive contexts such as courtrooms, doctor/patient meetings, academic classes etc., which shows the need for distinguishing between different types of dialogues. The rules which govern dialogues differ according to the dialogue type, and some moves which would be prohibited in a certain dialogue could be allowed in another (Walton, 2007). Identifying the type of

[6]Throughout this work, the term "proponent" is used to refer to the speaker who asserts a certain claim, while the term "opponent" refers to the hearer.

dialogue at stake when analysing discourse allows understanding the speakers' goals and respective roles.

Segmented Discourse Representation Theory (SDRT) Segmented Discourse Representation Theory (Lascarides and Asher, 2008), as RST (see Section 2.2.3), is a model for the representation of discourse relations in which semantics is the major focus. SDRT conceives argumentation from the point of view of logic rather than linguistic, leaving little room to pragmatical accounts of argumentative dialogues. The theory indeed is primarily interested in the processing of the logical structure of texts (to resolve anaphora for example). Despite a dynamic view of discourse, SDRT is irrelevant for the present work since the account of dialogues sought here must rely on linguistic as well as logical descriptions of argumentation.

The pragma-dialectical approach to argumentation Van Eemeren and Grootendorst developed the pragma-dialectical approach of argumentation (van Eemeren and Grootendorst, 1984), a theory which views critical discussion as an ideal discussion in which the reasonable discussants agree that they have a difference of opinions and want to resolve it. Its genre and context-free position claims that all argumentative interactions can be weighed against and compared with the ideal model of critical discussion[7]. The pragma-dialectical view of argumentation therefore offers a convenient normative framework with which any dialogical argumentative interaction can be compared. The pragma-dialectical approach underlines the idea of argument exchange in order to resolve a conflict of opinion. In the ideal model of critical discussion, a dialogue is decomposed into four stages: confrontation, opening, argumentation and conclusion. The confrontation stage is when differences of opinion appear; the opening stage is when the disputants set up the rules of the discussion which must lead to the resolution of the conflict; in the argumentative stage, the disputants confront their opinions and try to convince their opponents; in the concluding stage disputants acknowledge that the difference of opinions has been resolved or cannot be resolved, which ends the discussion. Each stage of a discussion has its own rules which participants must follow; participants in a discussion must reach their

[7] In pragma-dialectics, a monologue can be seen as a dialogue as long as arguments are put forward.

dialectical goal (i.e. follow the rules of the critical discussion) and their rhetorical goal (i.e. have their standpoint(s) accepted); for this, they have to *strategically manoeuvre* (van Eemeren and Houtlosser, 1999). Strategic manoeuvring is important indeed in dialogues, where each speaker tries to win the dialogue (that is, try to convince the hearers), without nevertheless violating the discussion rules.

A note on normative and descriptive approaches A distinction is often made between frameworks which focus on the actual practice of argumentation and those which focus on the best practice. While some theories of argumentation look for an accurate description of dialogues (descriptive approaches), others aim at providing frameworks in which argumentation can be evaluated (normative approaches). Normative approaches (such as pragma-dialectics), see argumentation as an ideal communication (or form of discourse) which all discussions should aspire to attain. Normative views therefore indicate how argumentation *should be*. Descriptive approaches such as RST for dialogues, on the contrary, explain what actual argumentation *is* by focusing on the interaction between disputants. Normative approaches therefore compare argumentation with norms, while descriptive models empirically study argumentation as it is constructed by real-life dialogues.

Annotation schemes for the analysis of dialogues Analysing dialogues must rely on stable schemes which elicit linguistic, semantical, logical or pragmatical features of the discussions. Several models have been developed in this vein. RST's annotation schemes for discourse relations is a large (and growing) set of rhetorical relations (such as elaboration, joint, justification, etc.) but we have seen that they do not cover argumentative relations (see Section 2.2.3). The HCRC (Human Communication Research Centre) Map Task Corpus is a set of analysed dialogues between two speakers: one giving the other his instructions. Therefore these dialogues are primarily meant to provide information to an interlocutor so that he can execute a task (Anderson et al., 1991); as a consequence argumentative acts are not present, which cannot help for the present task. The AMI Meeting Corpus is a corpus of conversations occurring during meetings, in which speakers discuss about design projects. The elaboration of a project necessarily involves making propo-

sitions and accepting or rejecting peers' ideas, therefore it is expected that the dialogues contain arguments and counter-arguments. However, the annotation scheme consists of dialogue acts which do not relate to the argumentative activity, but only focus on dialogical behaviours (such as information exchange, possible actions, or backchannels) (Renals et al., 2007). As a consequence, neither is this scheme set suitable for the study of dialogical argumentation.

Inference Anchoring Theory (IAT) Inference Anchoring Theory (IAT) (Budzynska and Reed, 2011) is an analytical framework for dialogues. It allows to represent the structure of argumentative dialogues by eliciting the illocutionary forces of locutions (see e.g. (Budzynska et al., 2014b)). The expression 'argumentative structure' cannot be separated from IAT: it has to be understood as 'the shape of the discussion', i.e. how the discussants' moves in a dialogue work together to create argumentation. Grounded in Speech Act Theory (see Section 2.2.2), this framework tackles what SAT fails at capturing: the relationship between sequences of speech acts. With the representation of the argumentative structure as a final goal, IAT makes it possible to show how arguments are constructed through dialogical exchanges. Designed to allow incorporating a large variety of argumentation theories, it is flexible enough to be applied to any type of dialogue. Since IAT relies on a standardised representation of arguments and argumentative structures, any argumentation theory schemes can be used to refine the analyses, and the reusability, revision and exchange of the IAT-analysed dialogues is hence ensured (more details are given in Chapter 3). IAT is a valuable tool to analyse argumentative dialogical interactions in a unified manner and in any discourse context. All these advantages make IAT a privileged model for the analysis mediation discourse to reveal its argumentative and dialogical patterns. A detailed account of the model is provided in Section 3.1, and its application to a dialogical context to test its usability is also presented in Section 3.2.

This section has provided an overview of what argumentation theories can teach us about arguments in the sense of disputes as well as standpoints and their supporting claims. This knowledge is crucial to understand mediation discussions since disputants have a conflict of opinion which they need to resolve through argumentation. The follow-

ing section provides a summary of the research which has tackled argumentative discourse in mediation.

2.4 Argumentation in dispute mediation dialogues

Mediation takes the form of a dialogical interaction since the parties talk about their dispute to resolve it, and the mediators take part in the discussion whenever the discussion is blocked (see Section 2.1.2). What needs particular attention, however, is the place that argumentation takes in mediation dialogues. To study argumentative interactions, it is crucial to have knowledge about the context in which they take place, therefore general information on what dialogues in mediation look like is needed. This section provides an overview of the literature concerned with dialogues in mediation. We will see that the extent to which argumentation is part of the mediation process has been explored in several research works, which offer a rich empirical study of the argumentative discourse in mediation with a particular emphasis on the mediator's role.

2.4.1 The mediator's role

In principle, the mediators' role is to facilitate the discussion between disputants. We have seen in Section 2.3.3 that five different types of argumentative dialogues have been identified in everyday conversations. These dialogue types can be found in mediation (Vasilyeva, 2010). For example, when a mediator asks what the parties think the cause of their conflict is, she is seeking information (information-seeking type of dialogue); when a divorcing couple fights to obtain full custody for their children, one side will probably try to persuade the other that the children will have a better life with her (persuasion dialogue), etc.

As we will see in more detail in Chapter 5, Jacobs and Aakhus (2002b) have identified three basic types of discussion which happen in mediation: bargaining, therapeutic, and critical discussion (see the pragma-dialectical model (van Eemeren and Houtlosser, 2003)). In bargaining, parties present offers and counteroffers to negotiate. Therapeutic discussions emerge when parties misunderstand or disrespect each other; therapeutic

dialogues are thus marked by feelings and emotions. In critical discussion, parties who disagree on facts and public values engage in a discussion to resolve their conflict of opinion.

The concept of critical discussion allows us to understand a lot of mediation discursive characteristics, as we will see throughout the present work. The critical discussion is an ideal way of resolving a conflict and, in dispute mediation, participants look for the best way to resolve their dispute; therefore, comparing dialogical interactions in mediation sessions to the ideal critical discussion promises to be helpful to understand the argumentative activity in mediation. We have seen in Section 2.3.3 that in pragma-dialectics, critical discussion is composed of four stages (van Eemeren and Houtlosser, 2003): the confrontation stage, the opening stage, the argumentative stage and the concluding stage. During these stages, the speakers must follow norms – or rules – in order to have an effective argumentative discussion. These four stages can be delineated in a dispute mediation (Greco Morasso, 2011). The confrontation stage corresponds to the moment when the dispute arises (i.e. when the difference of opinions appears); the opening stage is when the parties agree that they have to resolve this difference of opinion and decide to recourse to mediation, and the mediator explains the procedures which will be followed for the conduct of an efficient discussion. The argumentative stage corresponds to the discussion between the parties and the mediators, the goal of which is to get to an agreement. Finally, the concluding stage is the resolution of the dispute : all parties agree on it and all issues are resolved[8].

Greco Morasso claims that a mediation is essentially about negotiating and that mediators intervene to facilitate the negotiation (Greco Morasso, 2011). Relying on pragma-dialectical accounts of argumentation, she also claims that mediators' interventions mainly happen in the confrontation and opening stages (see Section 2.3.3) and their first task is to open the communication between parties so that disputants are able to talk to each other. Disputants indeed go to mediation usually because they are unable to communicate to resolve their conflict. As noted by Greco Morasso, it is not sufficient to have different

[8]Even though mediations may fail, a majority of them are successful. As an example, a report accessible at `justice.gouv.fr/art_pix/Stat_Annuaire_ministere-justice_chapitre13.pdf` reports that, in France, out of the 15,314 mediations ordered by the judicial system in 2014, 12,546 were successful.

points of view to make an argumentative discussion: there has to be an *argumentative space* (comparable to the confrontation stage in critical discussion) which will be opened thanks to the mediator's interventions. In the confrontation stage, the mediator focuses on the origin of the conflict and the initial difference of opinion (this is necessary, given that it is what must be solved). Once this has been identified, the argumentative discussion does not start. First, mediators must make sure that all issues have been identified so that the option generation, reality testing and bargaining can happen (see Table 2.1 in Section 2.1.2). This crucial step has also been highlighted for negotiations (Fisher et al., 1987), the core activity in mediation dialogues according to many authors (e.g. (Greco Morasso, 2011; Kovach, 2005)).

As Greco Morasso's research has shown, the pragma-dialectical approach is a helpful framework in which argumentative discourse can easily be described. However, the approach inherently restricts itself to reasonable exchanges, and it has been shown that no discussion exactly fits the critical discussion model (see for example (Bonevac, 2003)). In mediation, participants often face moments in which the discussion is blocked and nothing constructive comes out of it, which is far from being the sign of a perfect and ideal discussion: in such cases, pragma-dialectics only indicates that the discussion is not ideal but does not help in describing the actual argumentation. A blocked discussion is called an "impasse". Impasses or, more precisely, sources of impasse, have been the focus of Aakhus (2003), who identified three main sources of impasse: *unwillingness to be reasonable*, *negative collateral implications* and *irreconcilable facts*. Parties are unwilling to be reasonable when they refuse to take the other party's or the mediator's view points into account; there are negative collateral implications when a party attacks her co-disputant's character; irreconcilable facts are parties' claims which cannot be verified by the mediator, such as the opponent's state of mind, future or unwitnessable facts. Aakhus has also demonstrated that, as a response to sources of impasse, mediators deploy specific strategies, as we will see in Section 2.4.2.

2.4.2 The mediator's strategies

Several authors have demonstrated the highly argumentative facet of mediation interactions (see (Greco Morasso, 2011) in particular), but, as we have just seen, a particular attention has been given to mediators who:

> [a]ccording to the official idea of neutrality, [...] must resist the impulse to argue or disagree with one or the other party, to refute or support positions, to challenge and contradict, or to bolster and confirm. (Jacobs, 2002, p. 1406)

This means that, although they are in charge of the argument (in the sense of dispute (O'Keefe, 1977)), mediators must not argue for or against a party or issue as an arbitrator or solicitor would (Jacobs, 2002; Jacobs and Aakhus, 2002a; Greco Morasso, 2010). Mediators' neutrality poses a challenge when it comes to understanding their roles in the argument: how do they stay neutral while being in charge of the argumentation? This question has been explored, and several strategies have been highlighted in the literature.

Greco Morasso (2011) highlights the high frequency of questions in mediation dialogues. She shows in particular the usefulness of a certain type of questions which commit the answerer as much as the speaker: although these questions seem to be genuinely seeking for information they implicitly provide the speaker's – the mediator's, in particular – point of view. Greco Morasso has thus demonstrated that instead of arguing, mediators suggest arguments. For example, through their questions, mediators suggest hypotheses as to how to resolve the conflict that parties can verify and accept (Greco Morasso, 2008).

According to Jacobs (2002), mediators have to make sure the discussion goes in the right direction, and can justify the orientation they give to it. They manage to maintain their neutrality with three useful tactics: indirect advocacy (they ask different questions), framing advocacy (they summarise the discussion and issues) and equivocal advocacy (they provide information). These techniques allow them to subtly take position without having to explicitly argue. It has also been shown that reformulations are a useful way for mediators to advance standpoints without having to support their commitment since they only reframe or Rephrase the disputants' claims (Greco Morasso, 2008, 2011).

The apparent assertiveness of these mediator's moves does not jeopardise mediators' neutrality because they are put forward in specific strategies, which echo the strategic ma-

noeuvring concept in pragma-dialectics (Greco Morasso, 2008) (see Section 2.3.3). As we have seen in Section 2.1.1, giving a direction to the discussion is typical of mediator's moves, and their strategic manoeuvering is mainly noticeable in situations in which the dialogue between parties is blocked or, at least, about to derail, that is, when impasses threaten (see Section 2.4.1). The three strategies which Aakhus identified as responses to sources of impasse are *relativizing*, *temporising* and *redirecting*. Mediators relativize the parties' claims by presenting them as points of view rather than facts; they temporise the discussion by encouraging temporary arrangements when agreement on key issues cannot be reached, and they redirect the discussion by moving it towards a different issue (Aakhus, 2003).

To sum up, several works of research have demonstrated that argumentation is an integral part of mediation discussions and have principally focused on the mediator's role. Often relying on pragma-dialectical accounts of argumentation, these studies have put into relief the different strategies that mediators put into place which help them reconcile their obligation of neutrality role with the one of discussion leader. Greco Morasso's and Aakhus's works of research have tackled the argumentative activity in mediation dialogues, with a large emphasis on mediators' strategies. While Greco Morasso's research largely relies on pragma-dialectical concepts (such as strategic manoeuvring, argumentation stage, etc.) and compares mediation dialogues with the ideal model of critical discussion, Aakhus's works have demonstrated that three different types of discussions can occur in mediation (critical discussion, bargaining and therapeutic discussion) and that different sources of impasse lead mediators to deploy different strategies. Greco Morasso and Aakhus's lines of research however have common characteristics. For instance, both authors propose empirical analyses in order to determine how mediators manage to reconcile their neutral roles with the one of discussion leaders. They also have identified several mediators' strategies and highlighted the crucial role played by questions and the framing of such questions by mediators.

These investigations are a necessary source of knowledge for tackling mediation discourse characteristics. Although mediation strategies have been well documented, there

has been no thorough study on the relationship between argumentative strategies and dialogical procedure aiming at revealing detailed patterns of mediation discussions. In-depth analyses are required to attain this goal, with the view to model mediation dialogues for the development of a computational tool for trainee mediators. Computer science offers a framework where dialogues can be supported; for this, a precise and formal approach to mediation argumentative dialogues is needed. The benefit of using computational systems to support mediation practice therefore ensures the testability, verifiability and robustness of the results. The next section provides an overview of computational tools which can be used as supports for argumentative and dialogical interactions.

2.5 Computational tools to support dialogical argumentation

Mediation has little benefitted from technological advances to support the practice. In order to build a technological tool for mediation, it is crucial to know about the possibilities offered by computer science. It is clear from Section 2.4 that argumentation plays a major role in the resolution of disputes in mediation sessions. Some tools exist which allow computers assist in or perform argumentation thanks to the recent close link between computer science and argumentation theory. This section provides an overview of tools (i.e. theories, formalisms and physical devices) designed for mediation – or related ADR practices – that take into account the argumentative angle of the process.

2.5.1 Argument visualisation

Argument visualisation consists in graphically representing the logical structure of arguments. It is mainly used in teaching critical thinking, but also helps theorists and people involved in decision-making discovering and understanding arguments (Kirschner et al., 2012).

Often relying on Toulmin (1958)'s model or Freeman and Farley (1996)'s method of argument diagramming, a large number of theories have emerged which aim at visualising and describing arguments and argumentation (Shum, 2003). Following Freeman's major

work Freeman (2011), in argument visualisation, claims, counterclaims and the relationships between them are represented in the form of tree-structures. This helpful way of mapping otherwise linear arguments also allows evaluating arguments, strength of claims and (missing) premises.

Argument visualisation can be done on a piece of paper, but academics have put a lot efforts into developing software and web-based tools to easily and accurately create argument maps. A few examples of argument mapping tools are Rationale (see e.g. (van Gelder, 2007) and Figure 2.2 for an example of argument map created with Rationale), Araucaria (see e.g. (Reed and Rowe, 2004) and Figure 2.3 for an example of argument map created with Araucaria) or Agora-net (see e.g. (Hoffman, 2015) and Figure 2.4).

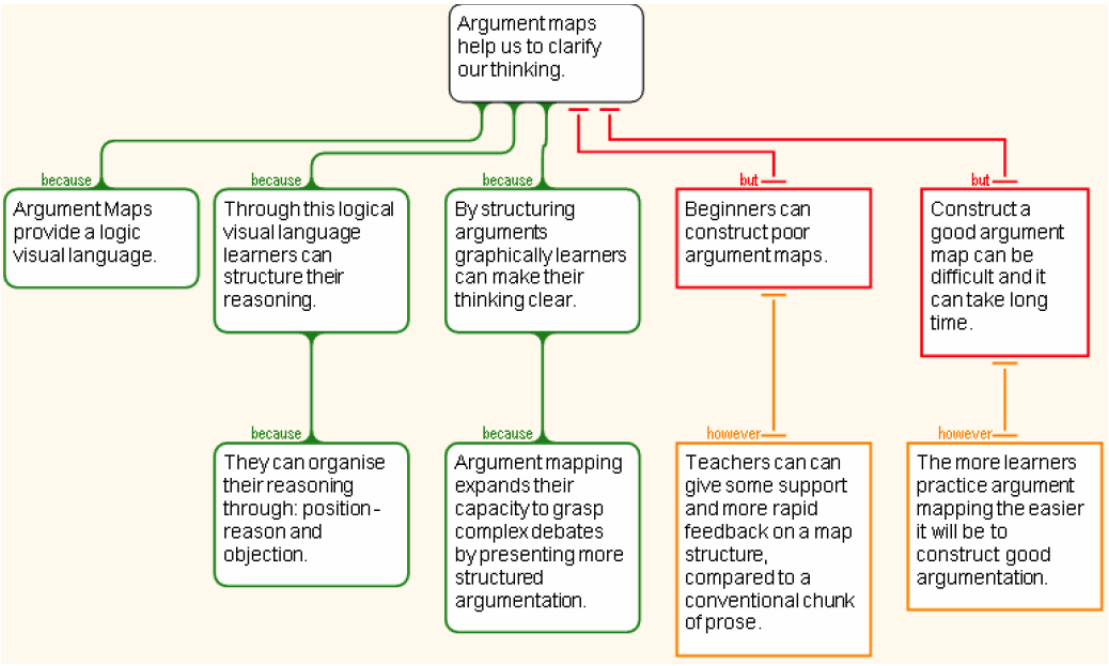

Figure 2.2: An argument map with Rationale, taken from (Okada et al., 2008, p4)

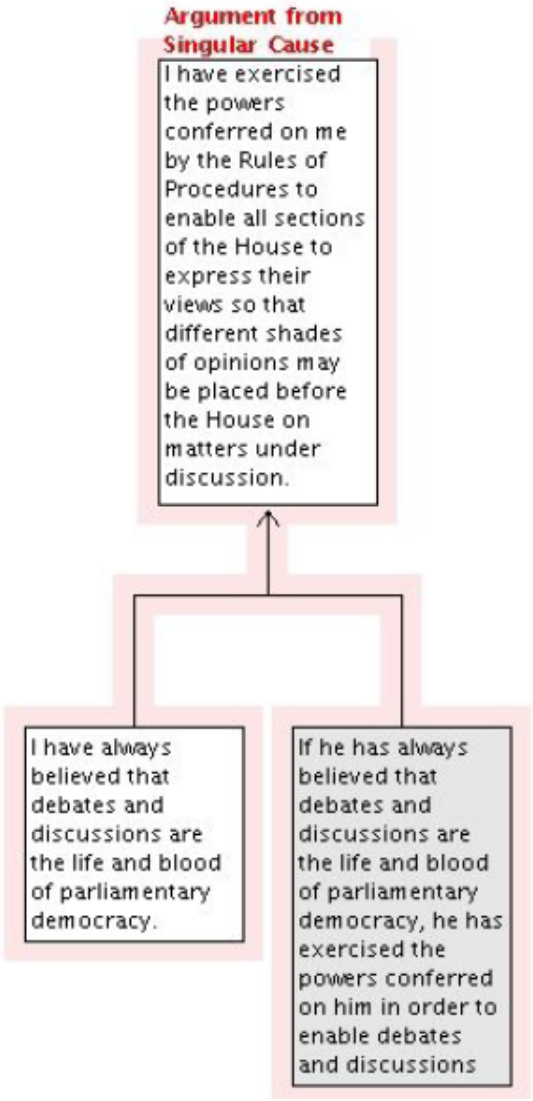

Figure 2.3: An argument map with Araucaria, taken from (Reed and Rowe, 2004, p9)

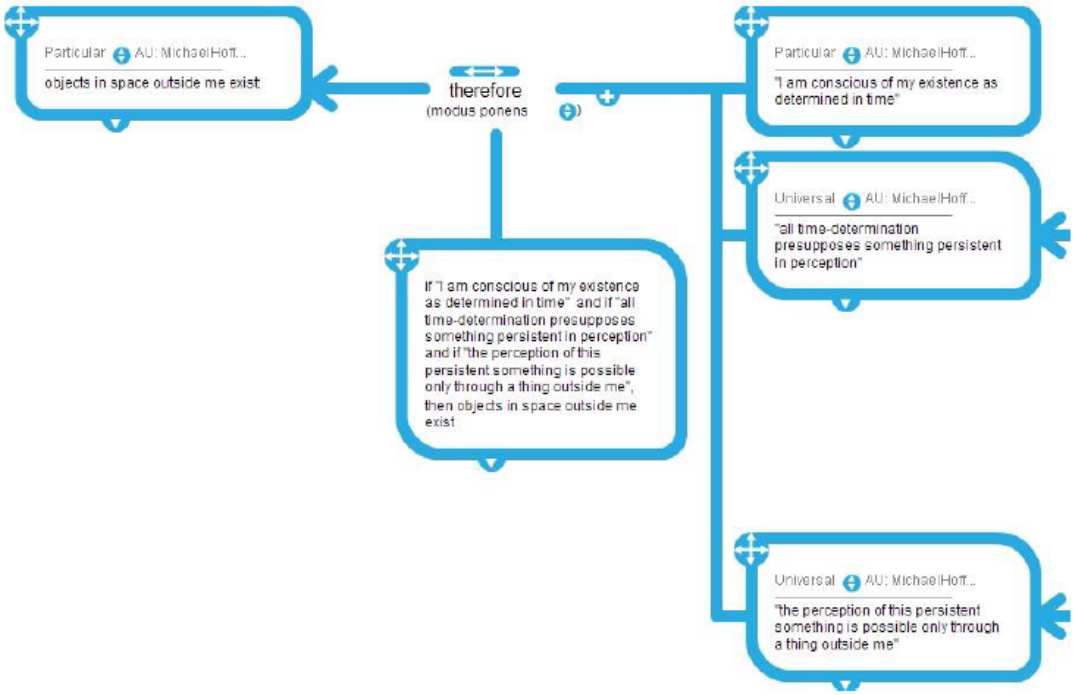

Figure 2.4: An argument map with Agora-net, taken from (Hoffman, 2015, p17)

The argument map created with Rationale shows the analysis of an argument, with its supports and conflicts and rebuttals. The analysis in Araucaria shows an argument with the taking into account of the argumentation scheme (see Section 2.3.2). In Agora-net, Figure 2.4, claims and their attacks can also be represented and it is possible as well to include references and links to resources, making the tool highly interactive. These are only a few examples of argument analysis tools that show that argument mapping takes into account the basic elements of arguments as defined by Toulmin (see Section 2.3.1) but additional features can be represented to capture more details.

Argument visualisation tools are usually based on different theories of argumentation which has led Chesveñar et al. (2006) to propose a standard language for argument representation: the Argument Interchange Format (AIF). Thus, argument maps can be exchanged and used in different tools. An ontology has also been developed in the AIF which allows representing dialogical arguments: AIF+ (Reed et al., 2008b). An example of argument visualisation tool which makes use of the AIF+ ontology is Online Visualisation of Argument, OVA+ (Janier et al., 2014b). OVA+ is the web-based tool which will be used throughout this work for the analyses of mediation dialogues.

The enormous number of arguments online (in fora, comments, social media, etc.) has

also led academics to create argument tools to study, store and allow people accessing and interacting with arguments found on the web (Rahwan et al., 2007); they see in the Argument Web an opportunity for researchers, companies and citizens to navigate between arguments for research, decision-making or information-seeking purposes. Tools and applications which make use of the Argument Web include AIFdb (Lawrence et al., 2012b), a database of argument maps realised online, argublogging (Snaith et al., 2012), a widget which allows users to show their opinion with regard to any text online, and the Carneades Argumentation Framework (Gordon and Walton, 2006), an analysis tool for argument visualisation, reconstruction and evaluation, largely relying on argumentation schemes and the attached critical questions. Note that Carneades, at first, did not make use of the AIF: Bex et al. (2012) have proposed a translation from the Carneades framework to the AIF and vice versa; consequently, Carneades can import, visualise and evaluate AIF argument analyses.

2.5.2 Online Dispute Resolution

In the 1990s, researchers and mediators started to develop the idea of online mediation. Their first arguments were that it would save the parties money (no need to pay for travels to reach the mediation room), improve communication between parties, and reduce emotions which hinder the mediation process (Eisen, 1998; Teitz, 2001). Technological advances have made it possible to transpose mediation (and other dispute resolution practices) to the web, what is generically called Online Dispute Resolution (ODR) (Hammond, 2003).

ODR is now becoming more and more popular and much research has focused on this specific way of resolving conflicts. It must be noted that some of the studies presented thereafter do not consider mediation specifically but rather give an account of online dispute resolution's characteristics and processes as a whole, which is nonetheless crucial for understanding this relatively new way of mediating.

The most common and easiest form of online mediation is e-mail exchange: parties send emails to each other but the mediator reads them first and can advise the sender on rewriting them if she considers that the content can be improved (e.g. if it is too emo-

tional, too ambiguous etc.). This form of communication has led people to question its advantages and drawbacks compared to face-to-face mediation. Raines (2005) emphasises the fact that miscommunication and misconceptions are worse online, which leads to more situations of impasse. In e-mails, people tend to communicate in an aggressive manner, which makes the communication process more complicated (Morris et al., 2002). In general, written communication can easily deteriorate because of the absence of cues such as politeness, nodding, eye-contact: people do not know if they are listened to and understood. Also, humour can be misinterpreted (Nadler, 2001). Moreover, it appears that in written communication, mediators have a tendency to ask fewer questions than in face-to-face encounters, while questions have a major role in the mediation strategies. In spite of these drawbacks, it has been shown that written communication can have advantages. Hammond (2003) shows that many ODR users feel comfortable with written communication and do not find it hard to express themselves – some even prefer written communication to spoken interactions. In (Raines, 2005) and (Rule and Sen, 2015), the authors explain that written communication is advantageous to some mediators' techniques. Reframing, in particular, is easier: mediators have to summarise the discussions because several days may have passed between two e-mail exchanges, and they can take advantage of this 'time off' to reflect on a the best way for doing so. Also, more generally, written communication offers one the possibility to cool down and carefully choose the right words, which can be valuable in such an emotional process (Nadler, 2001; Hammond, 2003). Hammond (2003) also shows that users of ODR put a particular emphasis on the valuable asset that written communication represents, in particular when it allows them to retrieve and review all previous communications.

As we have seen in Section 2.1.1, although emotions may hinder the mediation process, they are at times necessary to make sure that all grievances are tackled, and, as argued by Gilbert (2013), emotions are natural and necessary to argumentation. Hence, the fact that emotions tend to be limited in online mediation is sometimes seen as a drawback (see for instance (Eisen, 1998)). For disputes in which the relationship between parties is not particularly important (because they barely know each other for example), online mediation can be a convenient process. It must be noted, however, that for some

mediators, online mediation is more likely to work than face-to-face, even when emotions take a large part in the dispute: the distance offered by online communication can reduce anger for example (Eisen, 1998) because on-line communication forces people to calmly think about the issues at stake and about what they want to say, and in which way (Raines, 2005).

As highlighted by several authors, and as will be shown in Section 2.5.5, mediating online is likely to grow, particularly thanks to technology which is becoming more and more user-friendly (Raines, 2005; Rule and Sen, 2015). As we have seen, however, on-line mediation principally consists in emails exchanges, in which communication between disputants is much more regulated by the mediator. As a consequence, dialogues and argumentation between participants are less natural. The present work seeks to put a light on verbal interactions during argumentative dialogues in mediation. Focusing on regulated written exchanges would not teach us how disputants and mediators spontaneously manage the dispute and their arguments.Therefore, in the present work, only excerpts of face-to-face mediations will be studied.

2.5.3 Negotiation Support Systems, decision analysis and decision support systems

Many tools have been developed which aim at analysing or supporting decision making and some have been applied or specifically designed for mediation. We have seen in Section 2.4.1 that mediation can be seen as a negotiation. That is why some ODR services propose online negotiation to resolve a dispute. E-negotiations (Bichler et al., 2003) can be supported by Negotiation Support Systems (NSSs). These systems model negotiation discussions and most of them rely on Game Theory where trade-offs are mathematically modelled: each issue has to be assigned a number, and the ranking of issues change along the negotiation.

Decision analysis systems allow for suppressing, or at least minimising, numerous barriers to settlement. Thanks to decision trees, decision analysis tools transform the conflict into a logical structure from all the issues to all the possible solutions, and the ideal solution. This mathematical and logical representation can be useful in that emotions are

left aside for the benefits of reason and rationale (Hoffer, 1996). Indeed, decision analysis tools primarily help negotiating parties in defining their *BATNAs* (Best Alternative To Negotiated Agreement), that is, among a set of possible outcomes, which one is the best for a party. Studies however have shown that decision analysis tools met a modest success because of mediators' and parties' reluctance in letting a computer "decide" on their case for them (Hoffer, 1996).

To overcome this limitation, Bellucci and Zeleznikow (2005) have developed a negotiation decision support system specifically designed for mediation: Family_Winner. The main difference of this tool compared to traditional decision analysis tools is that the goal here is not to analyse the negotiation of issues but rather to provide an aid by advising on a solution. In this system as well, each issue must be assigned a number, and the allocation of issues changes along the negotiation. The authors argue that the tool guarantees fairness. To demonstrate the value of this prescriptive decision-making tool (that is, a tool which offers guidance as to how a solution can be improved rather providing a solution), it has been used to negotiate a well-know dispute: the Israel-Palestinian conflict. In (Zeleznikow, 2014), the authors have shown that the tool recommended a solution that all conflict experts and negotiators have agreed on for decades.

In (Yuan et al., 2003), the authors remark that the major limitation of those tools is that they all focus on decision support rather than process support. In other words, they only help the users in making decisions and do not allow for enhancing the mediation process. The authors have therefore defined the best means for an efficient and effective on-line negotiation. The authors created a web-based negotiation support system, enabling parties to use text, audio and video. Three groups of students were asked to negotiate a mock case using different features: text only, text and audio, and text, audio and video. The goal of the study was to verify if audio and video features made the negotiation easier, more efficient and more effective. Unsurprisingly, it appeared that text combined with audio gave better results; but the participants reported that the video brought nothing to the process; it even made it worse. This study was conducted in 2003 and video-conferences were not common and of poor quality so, the results must be replaced in this context and cautiously interpreted.

NSSs, decision analysis and support systems may represent valuable tools for the resolution of some disputes, however they tend to dehumanise the conflicts and the disputants since they reduce parties' issues to numbers, whereas psychological aspects and reason are central in mediation (see Section 2.1) and cannot be replaced by mathematical concepts.

2.5.4 Dialogue games

Dialogue games are another type of computational tools which provide insights as to what is computationally possible to support argumentative discourse in dialogical contexts. Starting from the claim that if we know why a human behaves in such or such way, then it is possible to create agents that will act in the same way (Stent, 2000), some research in the area has focused on modelling dialogues in order to create dialogue games (Fan and Toni, 2012; Prakken, 2005; Bench-Capon, 1998). In these lines of research, dialogues are seen as games in which the players must follow a predefined set of rules in order to move. Players symbolise speakers and, in a dialogue, moves are utterances, therefore, the rules allow for defining what type of utterance a player is allowed to perform and when. Such games have been applied in computational linguistics and artificial intelligence (AI), in particular to allow for human-computer interactions. To develop dialogue games, a dialogue protocol must be elaborated which consists of the rules which define how a dialogue initiates, how it must unfolds, what the restrictions are, and how the dialogue terminates. Dialogue games rely on the notion of dialogue types (see Section 2.3.3) in that the rules of the game protocol depend on the profile and aim of the discussion it models. Moreover, dialogue games can handle human interaction, and in multi-agent systems, there are at least two computational agents interacting (McBurney and Parsons, 2002).

As argued in (Yuan et al., 2011), there are two approaches for developing dialogue systems: a philosophical approach and a computational approach. In computational approaches, systems allow a clear and unambiguous communication between agents (human or virtual), in particular via the design of protocols. However, unambiguous communication is not what actually happens when people argue, as proven by the case of mediation.

That is why a philosophical approach has been taken in the development of dialogue games which more largely take into account characteristics of real communication (i.e. natural language), rather than the features of how conversations should be like, as in multi-agent systems (MAS).

Although they may be close to everyday conversations, a limitation of most dialogue games is their design of turn-taking, where one move corresponds to one turn, therefore preventing agents to advance more than one proposition at a time, or obliging them to react (Yuan et al., 2011). This does not reflect everyday dialogues and is an important weakness which needs to be overcome. Also, most dialogue games only capture the interaction between two agents, but Prakken (Prakken, 2008) developed a dialogue game for adjudication in which three agents can interact. This system is therefore close to mediation dialogues, in which at least three speakers are involved in a discussion to resolve a dispute.

Dialectical systems have the advantage of allowing human and virtual players to discuss, and to constrain the conversation in function of the needs. Moreover, dialogue games heavily really on the concepts of reasoning and argumentation, contrary to Negotiation Support Systems (cf Section 2.5.3 above). A drawback, however, is that each dialectical system has its own goals, and is hardly reusable by others or in other contexts. Modelling a dialogue can be either to better understand a type of discussion (see e.g. (Walton and Krabbe, 1995)) or to replicate a discussion in a computational environment for training as 'what-if' tools (see e.g. (Lawrence et al., 2012a)). Wells and Reed (2012) have developed the Dialogue Game Description Language (DGDL): a language for the specification of dialogue games which can be then implemented in systems supporting the format. DGDL offers the opportunity to describe a dialogue game in a language understood by different systems and which is translatable. Currently, DGDL is used in Arvina, a dialogue support system Lawrence et al. (2012a) which has been used in the context of public deliberation (see Section 6.4.1 for more details).

Dialogue games are ideal to replicate discussions in a computational environment, with or without virtual users. Their use as 'what-if' tools allows users to engage in a conversation and try different methods to attain their goals while being constrained by

the games' rules. As we will see in Chapters 5 and 6, it is possible to model mediation dialogues and define a dialogue game which, once implemented, allows users to engage in a discussion to resolve a conflict of opinion.

2.5.5 Mediation support systems

We have seen in Section 2.5.2 that Online Dispute Resolution is sometimes used to mediate disputes; in Section 2.5.3, we have seen that Family_Winner is also a tool used for mediation of disputes; and in Section 2.5.4, Prakken's dialogue game allows two disputants and an adjudicator to engage in a dialogue to resolve a dispute. These tools all provide information as to what is possible and needs to be done to support mediation practice. Two other computer-based tools have been developed which aim at supporting or at replicating mediation practice. Such tools have originally been developed as systems which support argumentation and in which users can review, browse and respond to messages.

The Zeno Argumentation Framework Gordon (1996); Gordon and Karacapilidis (1997); Karacapilidis and Gordon (1995) has been designed as a web system in which the general public is asked to give their opinions, ideas and criticisms about planning decisions (such as the development of a high-technology park between two cities (Gordon and Karacapilidis, 1997)). Given the high likelihood of conflictual viewpoints and interests between participants in debates, the system takes the form of an electronic discussion forum which aims at supporting argumentation and negotiation of issues. Citizens or their representatives can access the system to see the development plans and share their views and opinions about a debated issue. The formal model of argumentation on which Zeno has been developed allows to retrieve and show the arguments and their dependencies. The system assists human mediators in giving advice about the most promising solutions and the rights and obligations of participants and presents users with an overview of the state of the debate at any time. Figure 2.5 is a screenshot of the system as presented in (Gordon, 1996, p 193)[9].

[9]Zeno is a mock-up system. Since 2006, it has has been developed and commercialised as a tool, called *Dito*, used by the public and industrial sectors for e-participation in goal-oriented online dialogues; see `ontopica.de/index_en.php`.

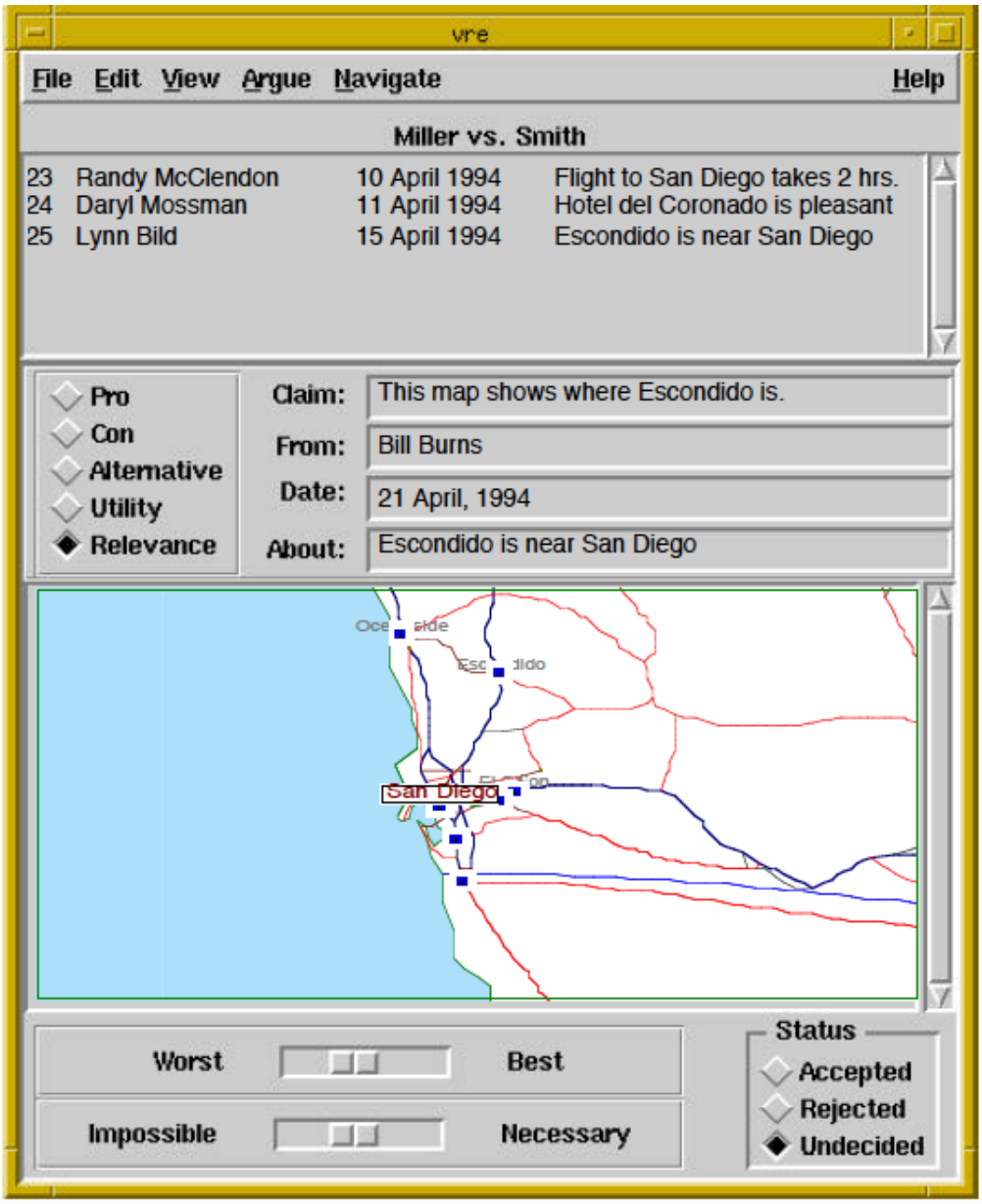

Figure 2.5: Screenshot of Zeno as given in (Gordon, 1996, p 193)

Gordon's line of work on mediation systems relies on a different working definition of the term mediation from the one used in the present work: mediation is every conflict resolution procedure which involves a mediator; as such, his research works do not specifically deal with civil case mediations, but are mainly interested in public conflicts and decision-making discussions such as city planning or environmental issues (Gordon and Märker, 2002). Although the mediation concerned in his projects differs from the civil case dispute mediations on which the present work focuses, the underlying idea is similar: the mediator must make sure participants obey the rules of the procedure and must provide guidance to, and ease the negotiation between people having different opin-

ions and interests (Gordon, 1996); his role is to advise and not to enforce any solution (Karacapilidis and Gordon, 1995).

Another system to support mediation practice is the interface for trainee mediators developed by Tanaka et al. (2007). This project is based on a data-base, in which each case is compared and analysed statistically, with the aim of evaluating the mediator's skills and the disputant's character. More specifically, the system enables the training of a student in mediation by proposing a case scenario. The interface relies in the presence of an argument agent i.e. a virtual agent who plays the role of a party. The agent is able to generate a reply to every move of the mediator or the other party since the system keeps track of the previous mediation discussions (keywords help in determining which case to retrieve to generate the responses). Each move of the agent is, in theory, relevant regarding the argumentation process as well as the character it has been assigned (selfish, single-minded or argumentative). Text responses are generated by retrieving the responses of a similar case in the data-base. Figure 2.6 is a screenshot of Tanaka et al. (2007)'s online mediation support system, in which users have avatars which allow showing their emotions (sad, angry, surprised etc.), an important feature since emotions and non-verbal communication may play a crucial role in dialogues.

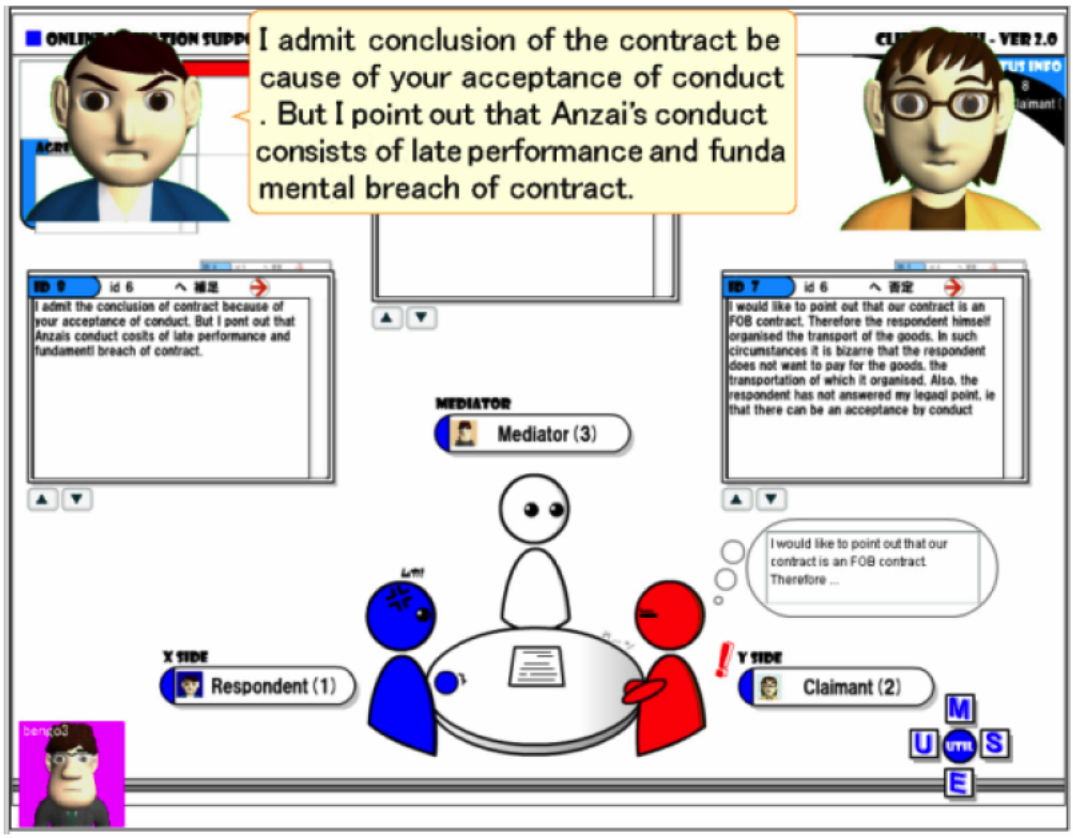

Figure 2.6: Screenshot of (Tanaka et al., 2007, p 381)'s system for mediation

Even if this system proposes interesting features, the authors themselves recognise it is too superficial, particularly with respect to the argumentativeness of the agent.

Gordon's and Tanaka *et al.*'s systems for mediation show that mediators can be assisted by computational tools which support the argumentative process. Gordon's line of work testifies to the possibility to enable mediators' competence in directing a discussion and providing guidance to parties in a computational environment. Tanaka *et al.*'s tool proves that systems for mediators' training must make use of previous mediated cases so that virtual agents can generate relevant responses to the mediators' questions. This system also highlights an important feature in mediation conversations: the parties' characters. Disputants' behaviours (i.e. their responses and reasonableness, for instance) clearly depend on their character. This shows that depending on their most prominent trait, discussions in mediation can take different paths. Although the modelling of speakers' character represents a challenge, it nevertheless makes discussions in computational environments closer to real dialogues. Tanaka *et al.*'s and Gordon's works therefore bring valuable information as to what must be taken into account in developing mediation sys-

tems.

This section has provided an overview of the computational tools which are sometimes used to support mediation practice. They all have their own advantages and drawbacks but give us information as to what has (not) been done, what can (not) be done, and what should (not) be taken into account for the design of a tool for mediators. ODR is largely used to replace mediation when face-to-face meeting are impossible (because of the geographical distance between disputants for example). In some websites, the mediator is played by a virtual agent which does not match our goal here, namely to provide assistance to a trainee mediator. Services in which it is human mediators who guide disputants to resolve their conflict show that written communication can lead to miscommunication, bringing additional challenges to the conversations. NSSs, decision analysis or support systems are useful in that they give users information on what the best solution to a conflict is; however, they remove the human side of a dispute, and natural argumentation, which makes dialogues possible, has not its place in these systems. Moreover, the majority of such tools is primarily concerned by the final solution, whereas in mediation, the process in itself is as important as the final result. Such systems cannot, therefore, be used to assist a mediator in deploying strategies to unblock the discussion if need be. Dialectical systems, on the contrary, are modelled according to the reality of dialogues. Therefore, all natural discursive behaviour can, a priori, be modelled to replicate a discussion. As a consequence, dialogue games represent the type of computational tool which can help achieving the current goal: proposing to mediators a tool to practice their skills. The Zeno system (Gordon and Karacapilidis, 1997) and that of Tanaka et al. (2007) provide additional keys as to what is crucial when developing a tool for mediation: the necessity to allow users to retrieve conversations, be it to permit the automatic generation of replies or to guide the users through the complexity of the argumentation and reasoning.

2.6 Summary

In this chapter, an overview of the state of the art has been given, showing that studying mediation discourse requires knowledge in various areas: discourse analysis, conflict resolution, argumentation, dialogical interactions and, given the final aim of the present

study, applied computing as well. This review of the state of the art in each domain has demonstrated the interdisciplinarity of the topic of dialogical argumentation in mediation, and therefore the need to reconcile the different domains.

As shown in Section 2.3.3, Inference Anchoring Theory is a framework which allows analysing discourse in depth, taking into account s which are crucial in mediation: dialogical and argumentative activities. Moreover, as we will see in the next chapter, IAT is grounded in the Argument Interchange Format, a standardised format which facilitates the usability of computational tools for argument analyses as well as the implementation of dialogue games. The following chapter therefore provides a detailed introduction to this analytical model, through its use in another, less complex type of discourse than the one in mediation: radio debate.

Chapter 3

Preliminary study: the Moral Maze

We have seen in Chapter 2 and Section 2.3.3 in particular that Inference Anchoring Theory is a powerful framework remarkably suited for the analysis of argumentation in dialogues. In the current chapter, IAT will be presented in detail before being applied to another argumentative type of discourse than mediation: moderated radio debates. This preliminary study is a crucial step to verify the usability and stability of the annotation framework before applying it to the discourse of interest in the present work, namely, mediation.

Though dispute mediation and radio moral debates are quite distinct on many aspects (such as the type of issues tackled, the contexts of the discussions and the relationship between opponents and proponents, to name just a few), these two types of dialogues also have some similarities. First of all, they both involve highly argumentative discussions; in radio debates, people discuss controversial issues: at least two persons with conflicting views take part in a debate which gives rise to animated dialogues in which many different arguments are put forward and attacked. Second, debates are supervised by moderators who make sure that participants have an equal chance to talk, and intervene as soon as they do not respect their opponents and their rights to speak. Finally, in mediation as well as in debates, participants usually try give as much arguments in their favour as possible but rarely manage to convince their opponents to adopt their points of view.

These similarities make radio debates an intermediate point for the analysis of dialogues in highly argumentative contexts and the application of IAT to investigate natural-language dialogical argumentation. In this chapter, the goal is to make sure that this analytical model is detailed and flexible enough to capture dialogical dynamics in lively

disputes.

3.1 An introduction to the Argument Interchange Format and Inference Anchoring Theory

IAT is a philosophically grounded counterpart to the Argument Interchange Format (AIF) (Chesveñar et al., 2006). We have seen in Chapter 2, Section 2.5.1 that the developers of the AIF have tackled the problem of the existence of a wide variety of argumentation theories by proposing a standard way of representing argument analyses. The proposed format allows various theories to make use of the same language in their argument visualisation tools, enabling the efficient interchange of data between tools for argument visualisation and manipulation (see e.g. (Reed et al., 2017)).

In the AIF, claims are represented as Information Nodes (I-nodes), and the relationship between claims by Scheme Nodes (S-nodes): inference relations are represented by RA-nodes and relations of conflict by CA-nodes[1]. An adjunct ontology, AIF+, was later developed to handle the representation of dialogical argumentation, in which the format of the dialogue structure mirrors the one of the argumentation structure (Reed et al., 2008b). Locution nodes (L-nodes) capture speech acts and speakers, whereas Transition nodes (TA-nodes) capture the relationship between L-nodes.

IAT has been developed to capture the missing link between argument structures and dialogue structures: by taking into account the illocutionary force of utterances, IAT allows the representation of illocutionary structures which link L-nodes to I-nodes. Moreover, given that some speakers' communicative intentions cannot be determined without knowing the broader context of the dialogue – that is, what an utterance is responding to – IAT assumes that it is only by taking into account the relation between L-nodes that some illocutionary forces can be inferred; as a consequence, these illocutionary structures are anchored in TA-nodes and can target I-nodes or S-nodes (to elicit inference or conflict relations between propositions) (Budzynska et al., 2016). IAT is therefore a framework developed for the analysis of dialogues in order to elicit argumentative structures. By

[1] Scheme of *preference* (PA-nodes) is handled by the AIF, however it is not mentioned here because it is not used in the present work.

making the illocutionary forces of locutions apparent, the model allows identifying the argumentative dynamics generated by dialogical moves. The IAT graphical representations of dialogical structures and the attached illocutionary and argumentative structures represent a valuable framework for fine-grained analyses of discourse.

An IAT analysis is therefore composed of several elements eliciting argument structures and dialogical dynamics via the representation of illocutionary connections, as summarised below:

- The right-hand side of a graph displays the dialogical structure with:
  - Locution nodes: the content of the utterances preceded by the speaker's identification
  - Transition nodes: the transitions between the locutions (or rules of dialogue)[2] (TA-nodes)
- The left-hand side of a graph displays the argumentative structure with:
  - Information nodes: the propositional content of each locution (in front of the corresponding locution node)
  - Relations of inference: they connect premises to conclusions (RA-nodes)
  - Relations of conflict: they connect conflicting information nodes (CA-nodes)[3]
- The relation between the dialogical and the argumentative structure:
  - Illocutionary forces connecting a locution node to the corresponding information node
  - Illocutionary forces connecting a transition node to scheme node (i.e. that can only be derived from the transitions between locutions)

[2] In a dialogue, locutions are the moves which speakers make. The rules of the dialogue should constrain speakers to advance certain types of moves and prevent them to advance others at some point in the dialogue. Transition nodes capture the concept of *rules of dialogue* by eliciting the relationship between locutions, that is, which rule has been triggered which allow a speaker to respond to another speaker, for example. This concept of *rule of dialogue* is visible in dialectical games, in which rules explicitly define the rights and obligations of speakers, as we will see in Chapters 5 and 6.

[3] Note that more types of relations between propositional contents can be represented in IAT, as we will see in Chapter 4 in particular.

– Indexical illocutionary forces connecting a transition node to an information node (more details are given with the example presented below)

Let's consider the simple example below, taken from the MM2012c corpus[4], and describe its IAT analysis in Figure 3.1. The dialogue in Example 1 involves Melanie, a panelist, and Alexander, a witness, who are talking about the morality of letting the State interfere in dysfunctional families.

(1) a. Alexander Brown: *If you're pointing to the phenomena of multiple or clustered disadvantage, if I were going to name one form of disadvantage as the key determiner it would be poverty, not lack of marriage.*

b. Melanie Philips: *Why?*

c. Alexander Brown: *Because evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage.*

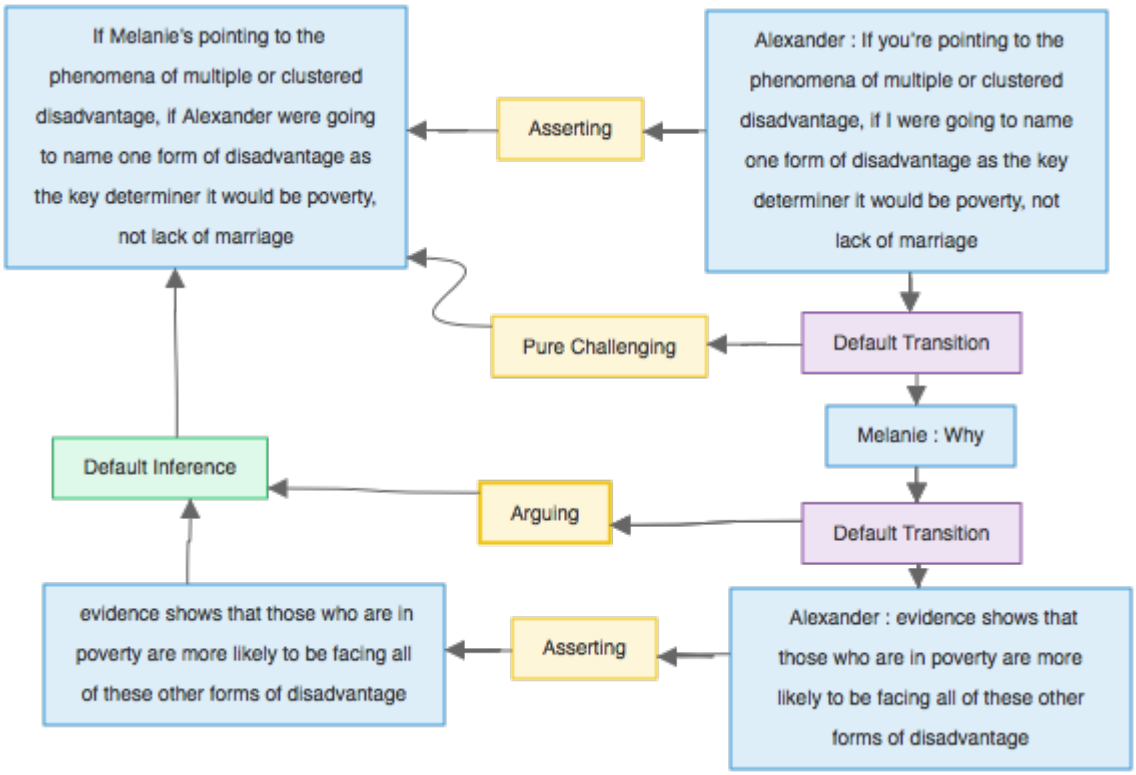

Figure 3.1: IAT analysis of Example 1

[4]More details about this corpus are given in Section 3.2 below.

Figure 3.1 (and the argument maps presented throughout this study) have been produced in OVA+, an interface for the analysis of arguments online, accessible from any web browser at `ova.arg-tech.org` (Janier et al., 2014b). It is a tool allowing what the developers of the Argument Interchange Format (AIF) have advocated, i.e. the representation of arguments and the possibility to exchange, share and reuse argument maps (Reed et al., 2008b). The system therefore relies on annotation schemes of a wide variety of theories, including IAT.

On the right-hand side of Figure 3.1, one can see the dialogical structure, with the speakers' locutions and the transitions between locutions which represent the dialogical relevance of moves, represented by Default Transition nodes (e.g. Alexander answered 1c as a response to Melanie's challenge in 1b).

The left-hand side of the figure represents the argumentative structure: the proposition *if Melanie's pointing to the phenomena of multiple or clustered disadvantage, if Alexander were going to name one form of disadvantage as the key determiner it would be poverty, not lack of marriage* is inferentially related to *evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage*; this is represented by the Default Inference node. This means that the first proposition is the conclusion and it is supported by one premise. As we will see with the different examples throughout this work, argumentative structures can also elicit counter-argumentation, represented by Default Conflict nodes (when a proposition is in conflict with another) and rephrasing, that is the relationship between propositions which have the same pragmatic meaning but may have a different linguistic surface (Konat et al., 2016); rephrasing is represented by Default Rephrase nodes. IAT can also handle reported speech by unpacking the propositional content of a reported speech and the propositional content of a reporting speech; more details about reported speech will be given in Section 3.2.5, in which such a situation (i.e. a speaker who reports someone else's speech) occurs.

Dialogical structures can make apparent argumentative structures only through the representation of the illocutionary structures, which are composed of illocutionary connections anchored in locutions and those anchored in transitions. Locutions have illocutionary connections which represent the speaker's communicative intention. In the ex-

ample, for instance Alexander's first move is an Assertion[5]. The concept of illocutionary connections is borrowed from Speech Act Theory (Austin, 1975; Searle, 1969; Searle and Vanderveken, 1985); for some speech acts, it is however impossible to determine what the speaker's intention is without knowing what the speech act is responding to; IAT solves this problem by taking into account the relationship between locutions (Budzynska et al., 2016). For example, here, we know that, when he says "Because evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage", Alexander argues only because this is a response to Melanie's challenge "Why?". Taken independently, the speech acts in 1a and 1c are merely claims but, considered together, they obviously perform an illocutionary act: in this example, Arguing is also clearly signalled by the discourse marker "because". These illocutionary connections are anchored in transition nodes because they exist only in virtue of the dialogical dynamics. Such illocutionary connections target the corresponding schemes in the argumentative structure: here Arguing is anchored in the transition node between Melanie's challenge and Alexander's answer, and targets the Default Inference node which holds between Alexander's Assertions which create an argument. Note also that some illocutionary connections are *indexical*: such illocutionary connections are also anchored in TAs, however they target a propositional content, rather than schemes. In the analysis of Example 1, Melanie's challenge "Why?" does not have its own propositional content but rather takes the content which is being challenged, i.e. Alexander's claim. In the following analyses, argument structures do not take into account enthymemes since only actual text is analysed; as a consequence, only propositions which have been uttered are represented. Note however that it is sometimes necessary to reconstruct the content of Information nodes to precisely reflect the propositional contents (for instance, full names must replace the pronouns used in locutions); this is necessary to represent the argument structure more accurately.

The IAT analysis of Example 1 in Figure 3.1 shows that IAT is well suited for the exploration of argument structures in dialogical contexts. It reveals the argumentative

[5]IAT annotations for illocutionary connections anchored in locutions are capitalised throughout the text to distinguish them from other annotation schemes or common nouns.

structure of the dialogue via the detailed analysis of dialogical dynamics (i.e. Melanie challenging Alexander's first utterance and Alexander answering the challenge). Not only IAT accurately reveals how dialogical acts work together to create arguments, but it also, and most of all, shows that the taking into account of the relationship between locutions, that is Transition nodes, is necessary to describe speakers' behaviours in a dialogue. IAT therefore indicates that argument structures are created in virtue of dialogical exchanges, and that the representation of utterances alone is not sufficient to understand the dynamics of argumentative dialogues.

In Example 1, Alexander's argument could easily be reconstructed, even without the taking into account of Melanie's challenge. In other dialogical exchanges, however, argumentation is less intuitively visible, and IAT helps discovering it. In the following section, analyses such as the one in Figure 3.1 have therefore been carried out on five transcripts of radio debates to check IAT's ability in capturing non-obvious argumentative dynamics, as well as its stability.

3.2 Corpus analyses of the Moral Maze

In the section above, we have seen that Inference Anchoring Theory provides a valuable framework for the analysis of simple dialogical arguments such as the one in Example 1. Before applying IAT to mediation discourse, its capacity in handling highly interactional discussions in which more complex dialogical situations are likely to happen (that is, other than the mere challenging of a claim) has to be tested. For this reason, IAT has been first applied to transcripts of radio debates.

The Moral Maze[6] is a regular British radio programme in which a moderator and (usually) four panelists engage in debates with (usually) four witnesses on current ethical issues (e.g. household debts, war in Syria, British welfare system etc.). An episode lasts around an hour and typically starts with the moderator, Michael Buerk, introducing the topic and panelists. Panelists then briefly give their opinion on the topic, and a first witness is introduced. Panelists ask each witness questions in turn and discuss the issue. The other witnesses are introduced in turn, once every panelist has had a chance to converse

[6] `bbc.co.uk/programmes/b006qk11`

with a witness. The episode ends with the moderator asking the panelists to summarise the ideas and opinions which were advanced throughout the episode. Aired on BBC Radio 4, Moral Maze is a quality programme, with serious issues and nationally renowned panelists coming from different political backgrounds. The quality of the exchanges is therefore high and further ensured by the moderator who makes sure that every intervening speaker has an equal time of speech. The dialogues are consequently well structured and irony or non-cooperative behaviours, such as explicitly refusing to answer a question, are very rare.

Applying IAT to Moral Maze transcripts allows testing the usefulness of the analytical framework in highlighting argument and dialogical structures in a highly interactional context, before moving to the discourse at stake in the present work: mediation. As a matter of fact, the presence of the moderator closely matches the mediator's role in mediation, because he makes sure that a wide range of issues are tackled and that the debate goes smoothly; he also asks questions to introduce new issues, and intervenes whenever speakers do not want to cooperate. Corpus studies have been carried out on the MM2012c corpus, containing five transcripts of Moral Maze episodes aired in 2012. All the analyses of the corpus can be consulted in the AIFdb Corpora at `corpora.aifdb.org/mm2012c`, a large repository of argument analyses for users to share and reuse argument graphs (Lawrence et al., 2015). The corpus has been annotated in OVA+ by four different coders who had similar linguistic training and good expertise of the IAT theoretical background. Analysing dialogues with IAT is a particularly time-consuming task because of the large variety of schemes and categories, hence the relatively small size of the corpus compared to the HCRC MapTask Corpus (15 hours of dialogues (Carletta et al., 1996)) or the 1.4M words of the Switchboard corpus (Jurafsky et al., 1997)) for example.

The annotation task was broken down into two steps: the first four transcripts have been annotated by two coders. The resulting analyses have been compared to calculate the inter-annotator rate in order to make sure that the annotation scheme was stable and accurate. During their analyses, these first two coders reported the problems they encountered. This allowed to enhance the IAT framework and its annotation schemes. Solutions

to the problems and general guidances on how to use IAT have been gathered in the draft 'IAT handbook'. This handbook was helpful to the third and fourth coders who, then, annotated the fifth transcript. Table 3.1 summarises the general characteristics of the MM2012c corpus.

Table 3.1: Characteristics of MM2012c

MM2012c	
Number of transcripts analysed	5
Words	41,926
Turns	812

The different steps of the annotation task are described in the following subsections, along with the guidelines to carry them out. The inter-annotator agreement, calculated with Cohen's κ (Cohen, 1960), is also reported for each task. To evaluate the agreement between annotators, a κ measure has been chosen over percentages which do not take into account the agreement by chance (i.e. the odds that annotators perform the same analysis by sheer luck). The κ results can be interpreted according to Landis and Koch's scale (Landis and Koch, 1977, p 165), as summarised in Table 3.2 below.

Table 3.2: Interpretation of κ results according to Landis and Koch

κ result	**Interpretation**
< 0.00	poor agreement
0.0 - 0.20	slight agreement
0.21 - 0.40	fair agreement
0.4 - 0.60	moderate agreement
0.61 - 0.80	substantial agreement
0.81 - 1.00	almost perfect agreement

3.2.1 Segmentation

An IAT analysis begins with text segmentation, that is, the locutions of the dialogue must be identified. The goal of an IAT analysis being to recognise the argumentative structure of a text, one locution should have an argumentative function and only one; therefore, locutions in IAT roughly correspond to argumentative discourse units (ADUs) as defined in (Peldszus and Stede, 2013). Let's take Example 2 below and identify the different segments which (may) play a role in the argument, that is, the ADUs.

(2) a. Clifford Longley: *I am intrigued by your saying that we mustn't judge the past by the standards of the present. You're a historian of this period and you know very well that even by the standards of 1959/1960, cold blooded murder was committed by British servicemen against prisoners. That's a crime then, not just a crime now.*

b. Lawrence James: *It certainly was, and the details of these outrages were known in London, they were repeated to the colonial office, Churchill had a vivid description of them...*

c. Clifford Longley: *Sorry to stop you, but where is this business of not judging the present by the past then?*

d. Lawrence James: *Well, I am saying that these crimes were committed, and I think it's extraordinarily regrettable that the military and colonial authorities did not punish those responsible.*

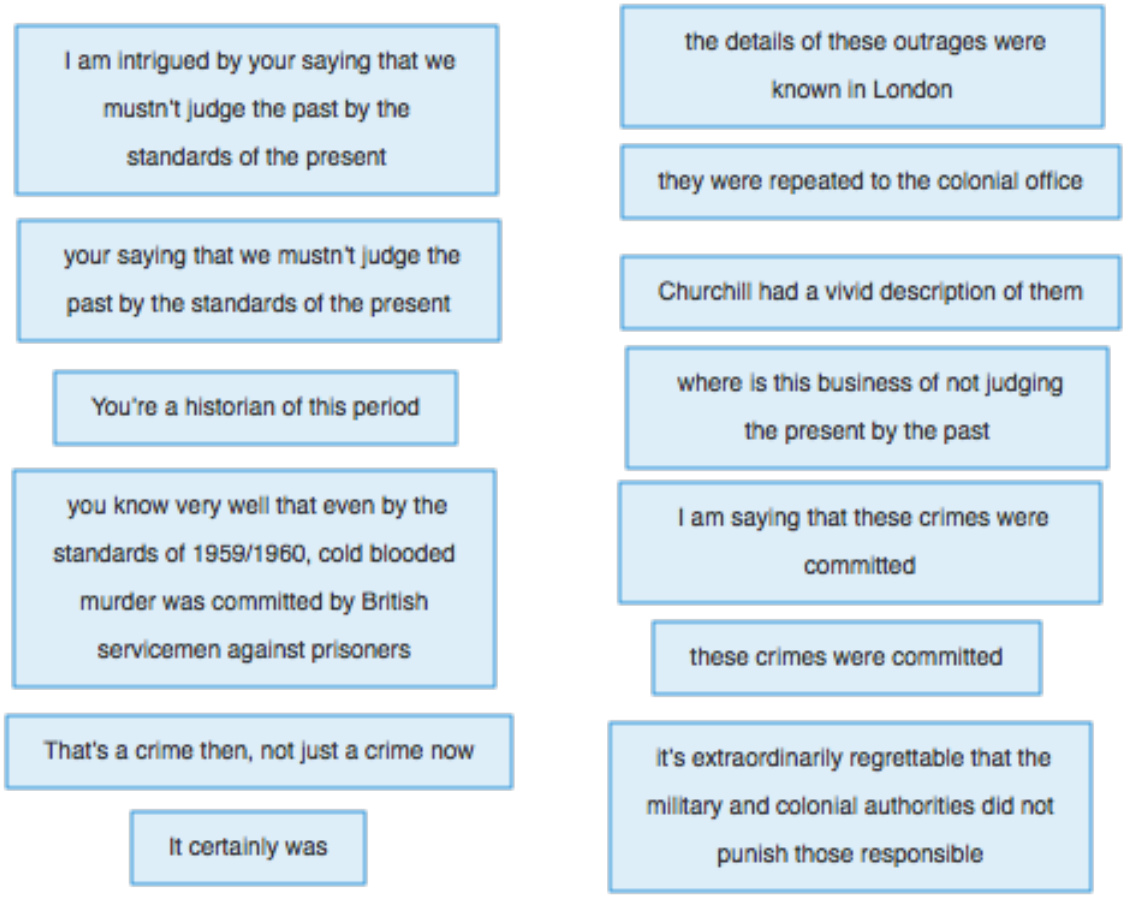

Figure 3.2: Segmentation of Example 2

Figure 3.2 presents the 13 argumentative units of the dialogue in Example 2. The first

one is "I am intrigued by your saying that we mustn't judge the past by the standards of the present"; this unit also contains itself a unit – the second argumentative unit – "we mustn't judge the past by the standards of the present". This sentence, uttered by Clifford, has actually two potential argumentative units because he is reporting someone's speech: the first segment in the figure is what he utters, and the second segment is what he says Lawrence uttered. Similarly, at turn 2d, Lawrence is reporting his own words ("I am saying"), therefore this locution contains two units as well. Each of the segments presented in the figure can play a role in the argument, and must therefore be represented in IAT. Some expressions in the dialogue do not play a role in the argument; these are *discourse markers* and do not need to be analysed in IAT. In the example, "Sorry to stop you" and "Well" are discourse markers, and are not analysed in IAT.

A total of 3,227 locutions have been identified in the MM2012c corpus. The inter-annotator agreement for this task is: $\kappa = 0.87$ which represents an *almost perfect agreement* according to Landis and Koch (see Table 3.2). As a comparison, discourse segmentation of the MapTask Corpus gives a $\kappa = 0.92$ (Carletta et al., 1997). This result proves that IAT guidelines for segmentation are stable and that the results of the following annotation tasks are likely to be good as well; a different segmentation by the annotators may indeed lead to different annotations for the following of the annotation task.

3.2.2 Identification of illocutionary connections anchored in locutions

The following step when doing an IAT analysis is to represent the illocutionary connections (ICs) anchored in each locution. In IAT, the basic illocutionary connections anchored in locutions are *Asserting*, *Challenging*, *Questioning* and *Popular conceding*. The guidelines to correctly identify them are given below.

Asserting (A) A speaker S is *asserting p* to communicate his opinion on *p*. It does not imply that S really believes *p*: it is rather a public declaration to which the speaker can be held. In Example 2, "You're a historian of this period" is an Assertion uttered by Clifford.

Questioning (Q) S is *questioning whether p* when S formulates *p* as an interrogative sentence of the form: "Is/Isn't *p* the case?". Three types of questions are distinguished

in IAT: **Pure Questioning (PQ)**, **Assertive Questioning (AQ)**, and **Rhetorical Questioning (RQ)**. In the case of PQ, S is asking for the hearer H's opinion on *p*: whether H believes *p*. AQ and RQ, in contrast, carry some degree of assertive force. For AQ, S does not only seeks H's opinion on *p*, but also indirectly publicly declares his own opinion on *p*. This IC is typically strongly signalled by linguistic cues such as 'Isn't it the case that...' or 'Can we agree that...'. Finally for RQ, S is grammatically stating a question, but in fact he is just conveying that he does (or does not) believe *p* and does not wait for H to answer the question. In Example 2, "where is this business of not judging the present by the past then?" is an Assertive Question uttered by Clifford (he asks a question to Lawrence, but also states that 'we should judge the present by the past' at the same time).

Challenging (Ch) When S is *challenging p*, S is seeking (asking about) the grounds for H's opinion on *p*. Challenges are a dialogical mechanism for triggering argumentation. For instance, in Example 1, Melanie's utterance "Why?" is a challenge, since she asks Alexander about the reasons for believing what he uttered at turn 1a. Similarly to questions, challenges form a continuum from **Pure Challenging (PCh)** through **Assertive Challenging (ACh)** to **Rhetorical Challenging (RCh)**.

Popular Conceding (PCn) Through *popular conceding*, S communicates some sort of general knowledge which is taken to be obvious and as such does not require being defended (i.e. it does not place a burden of proof on S). PCn is often introduced to the discussion in order to partly agree with the opponent using some generally accepted truths, but at the same time to prepare grounds for expressing disagreement in the next statement. This way, S shows that the real disagreement in the discussion lies elsewhere. In the example below, 3c is a Popular Concession uttered by Matthew.

(3) a. Matthew Taylor: *Isn't the idea of ethical investment banking a bit like tasteful lap dancing, you know, a kind of contradiction in terms?*

b. John Reynolds: *Well I've never been to a lap dance so it's difficult to answer that one.*

c. Matthew Taylor: *One assumes they're not very tasteful.*

Table 3.3 shows the number of occurrences of ICs anchored in locutions which have been annotated in MM2012c.

Table 3.3: ICs in locutions in MM2012c

IC type	Occurrences	Kappa κ
Total Asserting (A)	**1,786** (83%)	
Pure Questioning (PQ)	92	
Assertive Questioning (AQ)	138	
Rhetorical Questioning (RQ)	92	
Total Questioning (Q)	**322** (15%)	
Pure Challenging (PCh)	9	
Assertive Challenging (ACh)	7	
Rhetorical Challenging (RCh)	0	
Total Challenging (Ch)	**16** (1%)	
Popular Conceding (PCn)	**30** (1%)	
TOTAL	**2,154** (100%)	**0.55**

As expected, the most frequent category was asserting: this illocutionary connection occurred in 83% of the cases. The inter-annotator agreement result ($\kappa = 0.55$) is *moderate*. As a comparison, (Ohtake et al., 2009) have obtained a $\kappa = 0.68$ for the annotation of dialogue acts. The score obtained for the annotation of illocutionary connections anchored in locutions can be explained by the difficulty to clearly differentiate the three types of questions and challenges, as well as Assertions for Popular Concessions. The result shows however that the guidelines for the identification of illocutionary connections anchored in locutions are accurate enough and allow for an fair distinction between the different schemes.

3.2.3 Identification of transitions and illocutionary connections anchored in transitions

Transitions between locutions must be represented to show the relationship between them. These relationships (as we have seen in Section 3.1) are not a logical or linguistic relation, rather they represent a dialogical relevance: as will be shown in Chapters 5 and 6, they are rules of the dialogues which symbolise how speakers behave in the discussions (Yaskorska and Janier, 2015). Once the transitions between locutions are identified, the illocutionary connections anchored in transitions must be assigned. These illocutionary acts are often performed as a reaction to the opponent's moves: *Agreeing* is used for a positive reaction

(e.g. "Yes", "Indeed", "Most definitely") and *Disagreeing* for a negative reaction (e.g. "No", "I'm not saying that", "Actually, that's not correct"), etc. Below are the guidelines for annotators to identify the illocutionary connections anchored in transitions.

Arguing (Arg) S is *arguing* when he defends a standpoint i.e. when at least one premise is given to a conclusion. This IC can be signalled by linguistic cues such as "therefore" and "because", however, these indicators rarely occur in spoken natural language (Moens et al., 2007). Arguing takes as a content a relation of inference (see Section 3.1 and Section 3.2.4).

Note that in (Austin, 1975) or (Searle, 1969), Arguing is considered an elementary illocutionary force, at the same level as Asserting or Questioning for example. Argumentation, however, consists of more than one utterance, as evidenced by Toulmin's model; an argument indeed has at least two components: a datum and a warrant (Toulmin, 1958) (see also Chapter 2)). Datum and warrant being two claims, they must be captured by two illocutionary acts. IAT follows Toulmin's intuition: Arguing is an illocutionary force which exists only in virtue of the dynamic created by the two illocutionary forces of the premise and the conclusion (that is, the datum and warrant). This vision is also shared by van Eemeren and Grootendorst (1982) who consider the speech act of arguing an *illocutionary act complex*.

Agreeing (Agr) is used for expressing a positive reaction, i.e. when the speaker S declares to share the opinion of his opponent. This can take the basic form of positive reactions such as 'Yes', 'Definitely' or 'Sure', but may as well be a complete sentence. Agreeing takes as content a proposition earlier uttered, i.e. it is indexical (see Section 3.1).

Disagreeing (Disagr) is used for expressing a negative reaction, i.e. when S declares not to share the opponent's opinion. This can take the form of utterances which have similar meaning to 'No' (e.g. 'I'm not saying that', 'Actually, that's not correct', 'Definitely not', 'No it's not') or it can be an utterance with a complete propositional content. This IC takes as a content a relation of conflict (see Section 3.1 and Section 3.2.4).

Note that answers to Pure Questions (see Section 3.2.2) do not convey agreement or disagreement but commitment or non-commitment since Pure Questions do not contain the speaker's opinion: the hearer gives his opinion when he answers, and therefore indicates what he is committed to. In contrast, Assertive Questions contain the speaker's opinion, therefore answers to Assertive Questions do show an interlocutor's agreement or disagreement.

Table 3.4 presents the number of occurrences for these three types of ICs and the inter-annotator agreement result.

Table 3.4: ICs in transitions in MM2012c

IC type	**Occurrences**	**Kappa κ**
Agreeing (Agr)	119 (10%)	
Disagreeing (Disagr)	219 (18%)	
Arguing (Arg)	853 (72%)	
TOTAL	**1,191** (100%)	**0.76**

Obtaining a high κ for ICs anchored in transitions is a particularly challenging task due to their relational nature. For example, for just 10 locutions, we have 100 possibilities of connecting them, and as a result there are high chances that two annotators will provide different argument maps (e.g. a first annotator can link locution 1 and 2 with an instance of transition, while a second annotator can link the same locution 1 with a locution 5). Moreover, a transition node may link more than two locutions: if an annotator linked a locution with two others, but a second annotator linked it with only one of them, we considered that the transition node was different, and so is the illocutionary connection anchored in it. The inter-annotator agreement for this task is *substantial*, with a $\kappa = 0.76$, which shows that the guidelines are good enough to allow distinguishing between the three illocutionary connections. For comparison, Carletta et al. (1997), report a $\kappa = 0.83$ for the annotation of speech acts in the Map Task Corpus. As mentioned earlier, the scheme set for illocutionary connections for locutions may represent a challenge because of the difficulty to distinguish the three types of questions and challenges. On the contrary, it is easier to distinguish agreement from disagreement and to identify argumentation. Consequently, annotators obtained a better score for the annotation of illocutionary connections anchored in transitions.

3.2.4 Identification of inference and conflict

Argument structures are identified in IAT through the analysis of the relationships between the propositional contents of the locutions (left-hand side of the graphs). These relationships can be of two types in the Moral Maze analyses: *inference* (pro-arguments) and *conflict* (con-arguments). The following guidelines specify how to identify these categories.

Inference There is an *inference* between two propositional contents when one is supporting the other i.e. an argument can be reconstructed. As we have seen in Chapter 2, Section 2.3.2, according to Walton (1996), inferences can be of many different types (e.g. expert opinion, argument from example, etc.), but, in these corpus analyses, inferences have been annotated without distinguishing between argumentation schemes; they have all been labelled *Default Inference*.

Conflict Two propositions are annotated as being in *Default Conflict* relation when one propositional content is in opposition with the other, i.e when a speaker provides a contrary claim. Conflict holds between two propositions, when one proposition is used in order to provide an incompatible alternative to another proposition.

Table 3.5 summarises the frequency of instances of inference and conflict in our corpus, and shows the inter-annotator agreement results. Note that other relations between propositional contents exist, such as relations of preference or Rephrase; however, only inferences and conflicts have been annotated in MM2012c.

Table 3.5: Inference and conflict in MM2012

Type of argument structure	**Occurrences**	**Kappa κ**
Inference	870 (80%)	.55
Conflict	215 (20%)	.67
TOTAL	**1,085** (100%)	**.61**

The overall $\kappa = 0.61$ for this final step of annotations is *substantial*, which shows that IAT allows for a fair recognition of argument structures. Stab and Gurevych (2014) report the percentage of agreement for the annotation of conflict and inference in student essays, reaching 93% for inferences (supports) and 98% for conflicts (attacks). The high

inter-annotator rate in (Stab and Gurevych, 2014) can be explained by the monological context of the study, consequently presenting straightforward claims and counter-claims, contrary to dialogical situations.

3.2.5 Applying IAT to a Moral Maze excerpt to discover argument structures and dialogical structures

Sections 3.2.1 to 3.2.4 have provided the basis for analysing the Moral Maze argumentative dialogues with IAT. Let's now perform the complete IAT analysis of Example 2 presented in Section 3.2.1. For better legibility, the analysis is here presented in three figures[7].

[7]The reader can consult the analysis in a single argument map online at: `ova.arg-tech.org/analyse.php?url=local&plus=true&aifdb=12399`.

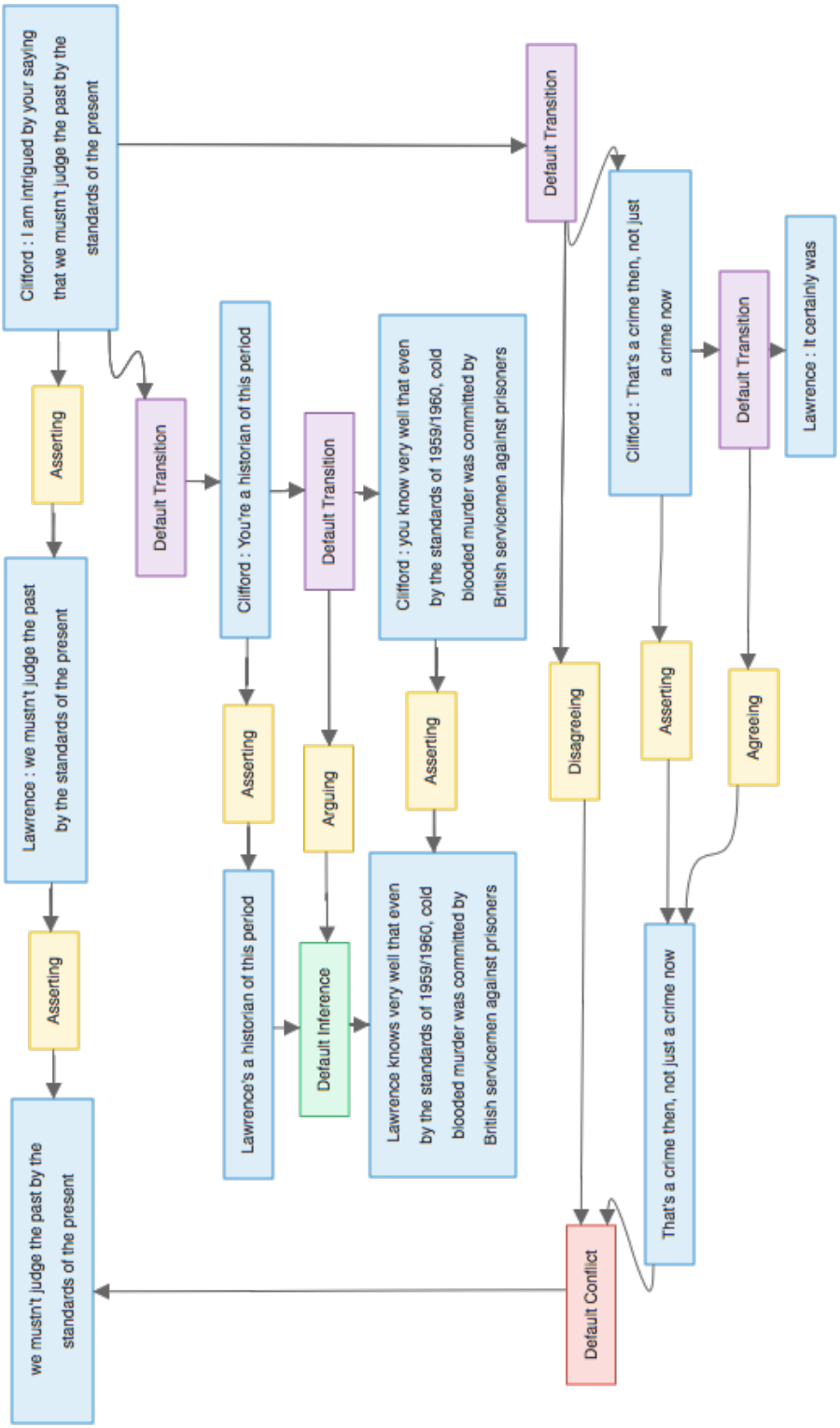

Figure 3.3: Analysis of Example 2, turn 2a and beginning of turn 2b

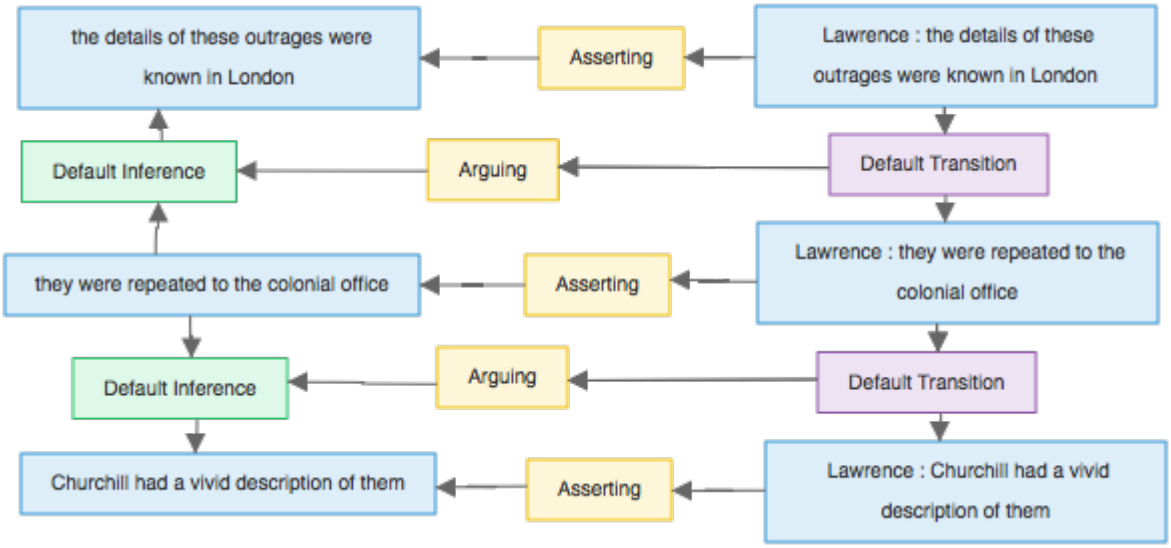

Figure 3.4: Analysis of Example 2, end of turn 2b

Figures 3.3 and 3.5 show how reported speech is handled. At the top of both figures, on the right hand side, one can see Clifford's first locution (turn 2a), which is an Assertion; in the middle is the reported locution i.e. what Lawrence said according to Clifford - which is an Assertion as well; and on the left-hand side is the propositional content of Lawrence's (reported) locution. In Figure 3.3, one can see that Clifford's first locution is linked via a Transition node to his second locution. His second and third locutions form an argument, the second one being the premise for the third one, the conclusion. His fourth locution is also dialogically related his first locution, which was reporting Lawrence's speech: he uses the propositional content of Lawrence's (supposed) locution to build a counter-argument. Lawrence's first utterance in the dialogue, in turn is dialogically related to Clifford's fourth Assertion: he agrees with this proposition.

Lawrence's following three Assertions, analysed in Figure 3.4, together form two arguments,"they were repeated to the colonial office" being at the same time a premise for "the details of these outrages were known in London" and the conclusion of "Churchill had a vivid description of them".

Figure 3.5 shows that Clifford's very first Assertion is linked to his locution at turn 2c, which is an Assertive Question; the propositional content of his AQ is in conflict with the propositional content of Lawrence's locution (i.e. the propositional content of the reported speech in the first move), which means that Clifford disagrees. Next, Lawrence

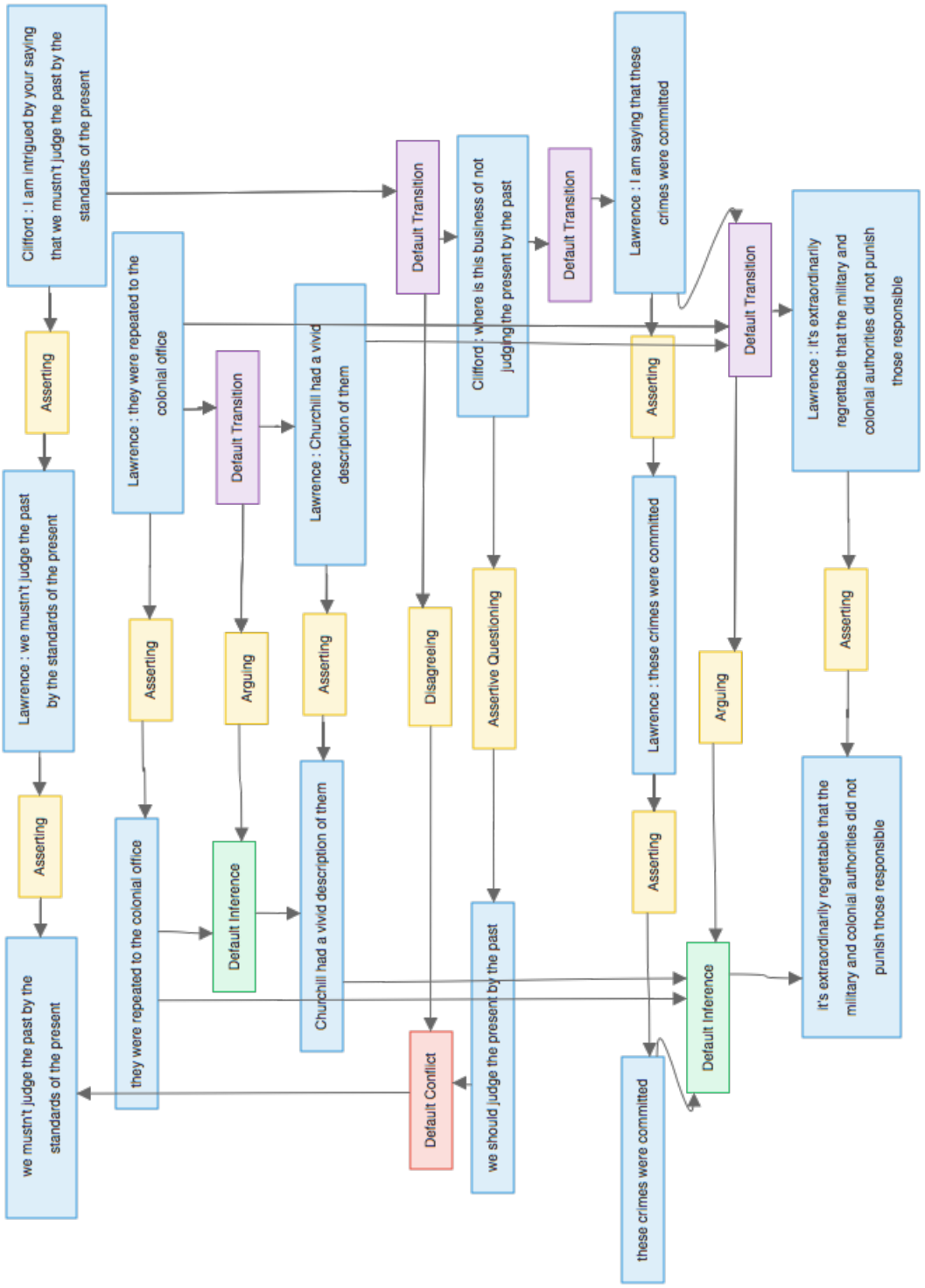

Figure 3.5: Analysis of Example 2, turns 2a, 2c 2d and end of turn 2b

reports his own words (this is analysed as reported speech as well), which allows him to argue once more: the propositional content "Churchill had a vivid description of them" and the propositional content of his own reported speech are two premises which support the content of his last Assertion: the conclusion.

The figures representing the IAT analysis of Example 2 have shown the structure of the dialogue and of the argumentative discussion between the speakers, as well as the interrelations between their locutions and propositions. It has revealed that Assertive Questions are not only useful to trigger a co-discussant's reaction, but can also be used to give one's opinion, and disagree. The analysis has also shown that reported speech plays a role in the argumentation (Clifford shows his disagreement and Lawrence argues through the use of the device of reported speech). This analysis has therefore permitted eliciting several dynamics in the dialogue between Clifford and Lawrence who can only be put into relief thanks to IAT's in-depth view of dialogical argumentation. As we will see in the coming chapters, other dynamics of this dialogue can be highlighted thanks to additional analytical schemes, which is made possible by IAT high flexibility.

3.2.6 Observations

Analytical and quantitative studies of the Moral Maze dialogues have revealed important features for the investigation of dialogical argumentation. Let's first summarise the results of the different steps of the annotation tasks in Table 3.6 and draw some conclusions out of them.

Table 3.6: Summary of corpus analyses

Type of structure	**Elements**	**Occurrences**	**Kappa κ**	**Weighted κ**
Dialogical	Locutions	3,227	0.87	**.68**
	Transitions	1,749	.74	
Illocutionary	IC in locutions	2,154	0.55	
	IC in transitions	1,191	.76	
Argument	Inference	870	0.55	
	Conflict	215	.67	
TOTAL		**9,103**	0.69	

The guidelines presented in this chapter have shown that IAT's tags are mutually exclusive. The framework schemes encompass 13 different elements, excluding the locutions and transitions identification, for 6 types of annotations (locutions, transitions,

illocutionary connections anchored in locutions, illocutionary connections anchored in transitions, propositional contents and argumentative structures). As a comparison, the annotation scheme for the Switchboard Corpus has a total of 226 tags (Jurafsky et al., 1997); the MapTask corpus contains 14 tags for three types of annotations (Carletta et al., 1996).

A total of 9,103 elements have been annotated in MM2012c. This type of discourse proved to be highly argumentative: there are 1,085 instances of (pro- and con-) argument structures identified out of a total of 3,227 locutions. The overall inter-annotator agreement has been calculated on a sample of the analyses (around 10%) as the Cohen's kappa κ averaged according to weights (or frequency) of the various schemes. Weighted measure, contrary to an arithmetic value of the mean, allows showing that if a scheme has a high κ score, but is infrequent in a corpus, then it should be treated as a less representative measure for the overall level of the inter-annotator agreement. For example, a reasonably good $\kappa = 0.67$ on 215 annotations of conflict relation should be treated as less representative than $\kappa = 0.87$ for the bigger sample of 3,227 annotations of locutions. The overall weighted $\kappa = 0.68$ warrants that there is substantial agreement between the annotators. Guidelines for annotations and annotators' competence are thus guaranteed to be reliable. As a comparison, (Kowtko et al., 1993) provide an inter-annotator agreement for the MapTask corpus in percentage, reaching 78%.

The various steps of annotations during corpus analyses of MM2012c have led to the discovery of characteristics proper to dialogues which provide important information as to how argumentation is performed in dialogical contexts. The statistical data given from Section 3.2.1 to Section 3.2.5 provide information from which several conclusions can be drawn. First, the frequencies of the illocutionary connections show that speakers mainly assert their opinions to argue (A and Arg are the most common ICs). What is surprising is that Arg does not seem to be realised via exchanges of the type presented in Example 1: the low frequency of Challenges shows that speakers do not wait for their opponents to challenge them to provide reasons for their opinions[8]. The high frequency of Assertive Questions, in contrast, shows that speakers often present their points of view in the form of questions and that this is how they look for consensus (see the frequency of AQs and

[8] As we will see in Chapter 6, this is also observed in mediation discourse.

Agr) (Yaskorska and Janier, 2015). Finally, Arg is more common than Agr or Disagr: this shows that the Moral Maze dialogues are not very collaborative (speakers do not often express agreement or disagreement between them; they rather argue in favour of their own opinion); the low frequency of conflict however proves that they are nevertheless cooperative since they do not counter-argue or disagree as much as they argue and agree.

In (Yaskorska and Janier, 2015), it has been shown that such analyses of the Moral Maze have helped to discover the typical behaviours of participants in debates, leading to a first step in defining a dialogue protocol for debates. This shows that the high level of details in IAT annotations provides valuable information on dialogical dynamics and their link with argumentation.

3.3 Summary of the preliminary study

Despite the inherent complexity of dialogues, it turns out that dialogical interactions contain valuable elements for the recognition of argument structures, evidenced by IAT analyses (Budzynska et al., 2014a). We have seen throughout Section 3.2 the different annotation tasks and their level of complexity, evidenced by the inter-annotator agreement results. In (Yaskorska and Janier, 2015), the authors drew some conclusions from the analytical and statistical study of the Moral Maze dialogues. The high frequency of AQs in the Moral Maze revealed that speakers tend to present their claims under the form of questions, which is a useful mechanism for one to give her own opinion, as well as to trigger an interlocutor's agreement or disagreement. It has also been shown that the realisation of argumentation does not always take the form of an Assertion being challenged and a second Assertion responding to the challenge. The information provided by the analyses have also allowed discovering that speakers mainly argue with Assertions and Assertive Questions.

It cannot be concluded that such behaviours occur in all dialogues; however, they provide a hint about how speakers argue in moderated real-life dialogues. Even though debates and mediation contexts are different and do not aim at the same outcome, the findings of this preliminary study provide information on how arguments are built in dialogues and how speakers typically behave.

These data are useful to broach the core of the present work, that is, analysing the argumentative behaviours of speakers in mediation. Moreover, the inter-annotator agreement of the corpus studies ($\kappa = 0.68$) shows that IAT is stable and a reliable framework for the analysis of dialogical arguments. As we will see in Chapter 4, the IAT annotation schemes presented throughout the present Chapter have been used to analyse mediation dialogues, but has proven to need some refinements to allow capturing characteristics proper to mediation discussions.

Chapter 4

Mediation corpus analyses

The previous chapter has presented IAT, an analytical framework which has helped to handle detailed analyses of dialogical argumentation in moderated debates. The preliminary study has revealed the strengths of the model which will therefore be applied for the analysis of mediation dialogues. First of all, a corpus of mediation dialogues will be presented in Section 4.1, and IAT analyses of this corpus for the discovery of argumentative and dialogical dynamics in mediation discourse will be carried out in Section 4.2.

4.1 Resources for the study of mediation discourse

As we have seen in Chapter 2, dispute mediation is a popular process in the resolution of conflicts, and more and more research emerge to enhance and better understand this practice. Corpus analyses are necessary to study discourse in this context; yet, little data is available, mainly because of its confidentiality principle. After proposing possible avenues to acquire transcripts of mediation sessions, this section presents the Dispute Mediation Corpus, which gathers annotated excerpts of mediation dialogues. It is freely available and the text data can be used by anyone. This first-ever open corpus of mediation interactions can be of interest to scholars studying discourse, but also conflict resolution, argumentation, linguistics, communication, etc. Using and extending this resource may be valuable to a large variety of domains of research, particularly those striving to enhance the study of the rapidly growing activity of dispute mediation, and is, above all, the corner stone of the present work.

4.1.1 Motivation

In different domains of research – such as sociology, linguistics or argumentation – an increasing number of academic publications focus on a better understanding of the growing practice of dispute mediation and are therefore concerned with its discourse (see e.g. (Greco Morasso, 2011; Greatbatch and Dingwall, 1997; Tanaka et al., 2007; Stokoe, 2012; Hoffer, 1996), etc.). Academics, however, meet difficulties in acquiring data to study discourse in mediation, namely because of its confidentiality principle. This lack of resources is a challenge which leads to advocate for an open corpus of mediation transcripts which would be valuable to research communities who strive to better understand this activity and try to make it more effective and more efficient. Such a corpus would be useful for different areas of research: conflict resolution, argumentation, linguistics, sociology, etc. It would allow sharing transcripts of dialogues in this understudied context, and several different research works would be made possible by building upon them. It would then be possible to compare, develop and expand previous studies. It would ultimately lead to an extended knowledge of this growing domain. Most of all, such a corpus is the corner stone of the present study: analyses of mediation discourse characteristics must be gathered and stored so that they can be retrieved and, if needed, corrected along the exploration of transcripts.

Several corpora have been created to boost research in linguistics[1]. They all are designed for various purposes and contain different data. For example, the Brown University Standard Corpus of Present-Day American English (or Brown corpus) (Kucera and Winthrop, 1967)[2], one of the oldest corpora of natural language containing more than 100 million words from written and spoken texts, and the British National Corpus (BNC) (Leech, 1992)[3] are intended for general use and present raw texts. The HCRC Map Task Corpus (Anderson et al., 1991)[4], which comprises 128 annotated dialogues, was built to support research in human communication, while other corpora such as the PennTree bank corpus, which presents linguistic trees (Marcus et al., 1993)[5], or the AraucariaDB

[1] Footnotes after the references which follow give the number of publications which cite these works of research, according to Google Scholar (`scholar.google.com`), as to April, 2017.

[2] cited in over 8,300 publications

[3] The BNC Handbook and Users Reference guide have been cited over 1000 times

[4] cited over 1000 times

[5] cited around 6,300 times

Corpus[6] (Reed et al., 2008a), composed of argument analyses, contain already analysed texts. These corpora, created for different uses, have not only been useful to the persons who assembled them, but they also have supported a large number of studies which were built upon them, as evidenced by the number of citations they attracted[7].

Building such a corpus for mediation discourse is a necessary step towards the goal of the present work: gathering a maximum of mediation discussions to carry out analyses for the exploration of argumentative dialogues. For this reason, some sources of real and realistic data are identified in Section 4.1.2. Section 4.1.3 introduces a newly created corpus of annotated mediation dialogues, gathering data from many different sources, and most importantly, openly available for the purpose of supporting research in mediation discourse.

4.1.2 Existing sources

Academic sources Although understudied – compared with traditional litigation for example – a growing number of research works have been concerned with discourse in mediation. Publications relying on analyses of transcripts sometimes present extracts of dialogues – a transcript of an entire mediation is, to my knowledge, never given. We list here some of the major publications in which the authors use transcripts of mediations and mention their provenance. In (Greco Morasso, 2011, 2008, 2010), the corpus consists of by transcripts of "exemplary interactions, from which mediators learn to mediate" (Greco Morasso, 2011, p.148), and the publications show various passages of the transcripts. The transcripts come from video-recorded real mediation sessions which have been distributed worldwide to train mediators. The studies in (Stokoe, 2012) are based on transcripts of "200 intake calls to five different UK-based community mediation services" annotated using conversation analysis. Jacobs and Aakhus (2002b) base their study of mediators' strategies on forty-one real mediation sessions, and present thirteen extracts.

This small source of mediation data – due to the scarcity of the excerpts presented – has nevertheless the advantage of providing real and typical mediation dialogues. It can

[6] Accessed by over 3,000 unique users during 2015

[7] The numbers provided by Google Scholar may underestimate the total of studies relying on the corpora but this gives an idea of their significance

be used by researchers who may find the content of the excerpts valuable for their own project. As an example, Janier et al. (2014a) analyse some passages taken from (Jacobs and Aakhus, 2002b).

The few works of research presented above have different goals and present different conversational contexts in mediation; they present therefore a wide range of exploitable information about mediation discourse; excerpts can be used for other research projects. Although the absence of entire transcripts may be an issue for research which would focus on understanding the mediation process as a whole, using excerpts taken from academic works is the easiest way to obtain mediation discourse data, and one can assume that the transcripts have been legally acquired, and have already proven to contain information suitable for analysis.

Online Sources Another way to obtain data concerning mediation discourse is to search resources online. Some websites present mediation scripts; they generally capture a small part of a mediation and are intended to train mediators or disputants willing to know how a 'standard' mediation unfolds, e.g. a guide for training mediators[8], the script of the beginning of a mediation session[9], or the typical introduction to a mediation[10].

Even though still rare, another relevant source of data when searching for 'mediation transcript' or 'transcripts mediation sessions' are videos of mock mediation, ranging from small excerpts (of more or less ten minutes)[11] to complete sessions[12]. Having such videos transcribed is a quick and easy way of getting data for the study of mediation interactions. An example of work based on (among others) online sources is (Janier and Reed, 2017a).

Professional Sources Role-plays or mock mediations can also be acquired through mediation services, which are keener on sharing them than genuine mediation sessions transcripts. Role-plays may not suit all types of research: in her comparison between role-plays and real police interviews, Stokoe has demonstrated that role-plays can be biased and contain interactions which are less natural than in real dialogues (Stokoe, 2013).

[8] e.g. `arg.tech/mediation-toolkit`
[9] e.g. `arg.tech/mediationscript-beginning`
[10] e.g. `arg.tech/mediation-intro`
[11] e.g. `arg.tech/mediationvideo-summary`
[12] e.g. `arg.tech/mockmediation`

Although they do not present real disputes, it can be assumed that role-plays provide realistic data because they are generally used to train mediators. As an example, (Janier and Reed, 2017b) relies on a transcript of a mock mediation provided by the Early Dispute Resolution (edr) centre in Dundee[13].

Another interesting track to follow is to discuss with mediation professionals. As an example, the organisation of the Transformative Technology in Mediation (T-Time) workshop[14] has led mediation professionals and researchers to advocate for the sharing of transcripts and videos; as a consequence, in order to facilitate the current research project, one provided a real mediation transcript, some excerpts of which have been analysed, for example in (Janier and Reed, 2017a). Depending on the type of research the data will be used for, it is sometimes important to emphasise that the transcripts can be anonymised.

This source of data has two advantages: one can be assured that the transcripts of real sessions provided by mediation services contain authentic interactions. As to role-plays, although they may seem less genuine (cf. (Stokoe, 2013)), they represent typical and standard interactions. The transcripts, moreover, may capture the entire sessions, which rarely happens (e.g. in academic publications).

4.1.3 The Dispute Mediation Corpus to support research in argumentation

All the different sources to obtain data for mediation discourse presented in Section 4.1.2 have their advantages and drawbacks; combining these different sources of data for the study of mediation discourse assures the construction of a large corpus with many different conversational contexts. For this reason, the *Dispute Mediation Corpus* (DMC) has been created as part of the current research project. It is available at `arg.tech/DMC`, and comprises almost 300 annotated mediation excerpts[15]. The annotations, realised with IAT in OVA+, are in the Argument Interchange Format, which makes it possible to store them in the AIFdb database (Lawrence et al., 2012b, 2015; Reed et al., 2017) to comply

[13] `dundee.ac.uk/academic/edr/`

[14] `mediationworkshopdundee.wordpress.com`

[15] The DMC has been created over the course of the research presented here; the work presented here is iterative, since additional transcripts have been gradually acquired.

with what the AIF advocates, namely making argument analyses available and exchangeable through a large variety of computational tools.

The Dispute Mediation Corpus: some details The DMC has been created as part of the present project which aims at exploring argumentation in mediation dialogues. This corpus of analyses has been annotated by the author of this work only. As we have seen in Chapter 3, IAT has been developed and shown stable in another project which focuses on dialogical interactions in the context of radio debates (see e.g. (Yaskorska and Janier, 2015)), and the results of the annotations gave an inter-annotator agreement reaching $\kappa = 0.68$. The author also helped in refining IAT guidelines, therefore the analyses presented in the corpus can be considered as accurate. Table 4.1 gives the characteristics of the corpus.

Table 4.1: Details of the DMC

Elements type	**Occurence**
Words	28,956
Locutions	3,480
Assertions	2,614
Assertive Questions	171
Pure Questions	212
Rhetorical Questions	56
Assertive Challenges	7
Pure Challenges	28
Rhetorical Challenges	7
Popular Concessions	20
Inferences	923
Conflicts	280
Rephrases	332

Though still relatively small, this resource contains a large number of different data, summarised in the above table. Apart from the category 'words', the elements reported in the table have to be understood according to IAT's definitions (see Chapter 3). A total of 3,480 locutions (with an average of 11.64 words) has been annotated, of which 2,614 are Assertions, 439 are Questions and 42 are Challenges. 923 schemes of inference and 2080 schemes of conflict (roughly 'arguments' and 'disagreements', respectively) have been identified. For now, the corpus only contains texts in English, but excerpts in any language may be added since corpora in Ukrainian, French and Hindi, for example, have

already been created in AIFdb.

The DMC is currently composed of 293 analyses of excerpts divided into six sub-corpora, according to the focus of the argument analyses:

- The sub-corpus *Dispute mediation: excerpts taken from publications*[16] gathers 58 analyses of dialogues which were found in academic publications, in particular (Greco Morasso, 2011) and (Jacobs and Aakhus, 2002b) (see Section 4.1.2). It was the very first sub-corpus created, mainly used as a starting point for the first explorations of mediation dialogical dynamics. The excerpts all come from real mediation sessions.

- The *Mock mediation* sub-corpus[17] comprises 50 analyses from two role-plays, one provided by the edr Centre (see Section 4.1.2), the other transcribed from a video found online (see Section 4.1.2). It has been mainly used to to support the findings in (Janier and Reed, 2017b), reported in Section 4.2 below.

- The *Critical discussion*[18], Bargaining[19] and Therapeutic[20] sub-corpora (14 analyses) were created for a project with Rutgers University and aims at comparing the dialogical and argumentative patterns of three types of discussions which can occur in mediation, as we will see in Chapters 5 and 6.

- The *Meta-talk in mediation* sub-corpus[21] (147 analyses) was created to explore meta-discourse elements in mediation interactions coming from all the various excerpts mentioned above, and is used in particular in Chapter 7.

Using the DMC The study presented here relies on the DMC resources which have been gathered over time, as the work progressed. In (Janier and Reed, 2017b), the *Mock mediation* corpus was used to present a method to analyse argumentative discourse in mediation (see Section 4.2 below); in (Janier et al., 2015), excerpts of this same corpus were used to analyse impasse and mediators' strategies; in (Janier et al., 2014a), the *Critical*

[16] corpora.aifdb.org/mediationothers
[17] corpora.aifdb.org/mockmediation
[18] corpora.aifdb.org/critical
[19] corpora.aifdb.org/bargain
[20] corpora.aifdb.org/therapeutic
[21] corpora.aifdb.org/metatalk

discussion and *Therapeutic* corpora were used to show the argumentative and dialogical differences between two types of discussions (see Chapter 5), etc.

The DMC is openly available at `arg.tech/DMC`, where both the original text of the dialogues and the annotations can be shared, consulted and exploited by the community interested in dispute mediation discourse. Figure 4.1 displays the DMC webpage, in which each already analysed excerpts is stored under an ID number. One can see extracts of the annotated texts on the left of the page and overviews of the argument analyses on the right. Each argument analysis can be downloaded in several formats (e.g .png, .json, .pl). To access a complete argument analysis, one can click on the OVA+ link: a window opens up with the IAT graphical analysis of the excerpt, as shown in Figure 4.2, for the argument map 10954[22]. To obtain the text of an analysed excerpt in the corpus, one can copy and paste the text on the left pane of the OVA+ webpage; a whole mock mediation transcript is also available by downloading the zip-file corresponding to the Mock mediation corpus on the AIFdb Corpora webpage.

[22] `arg.tech/10954`

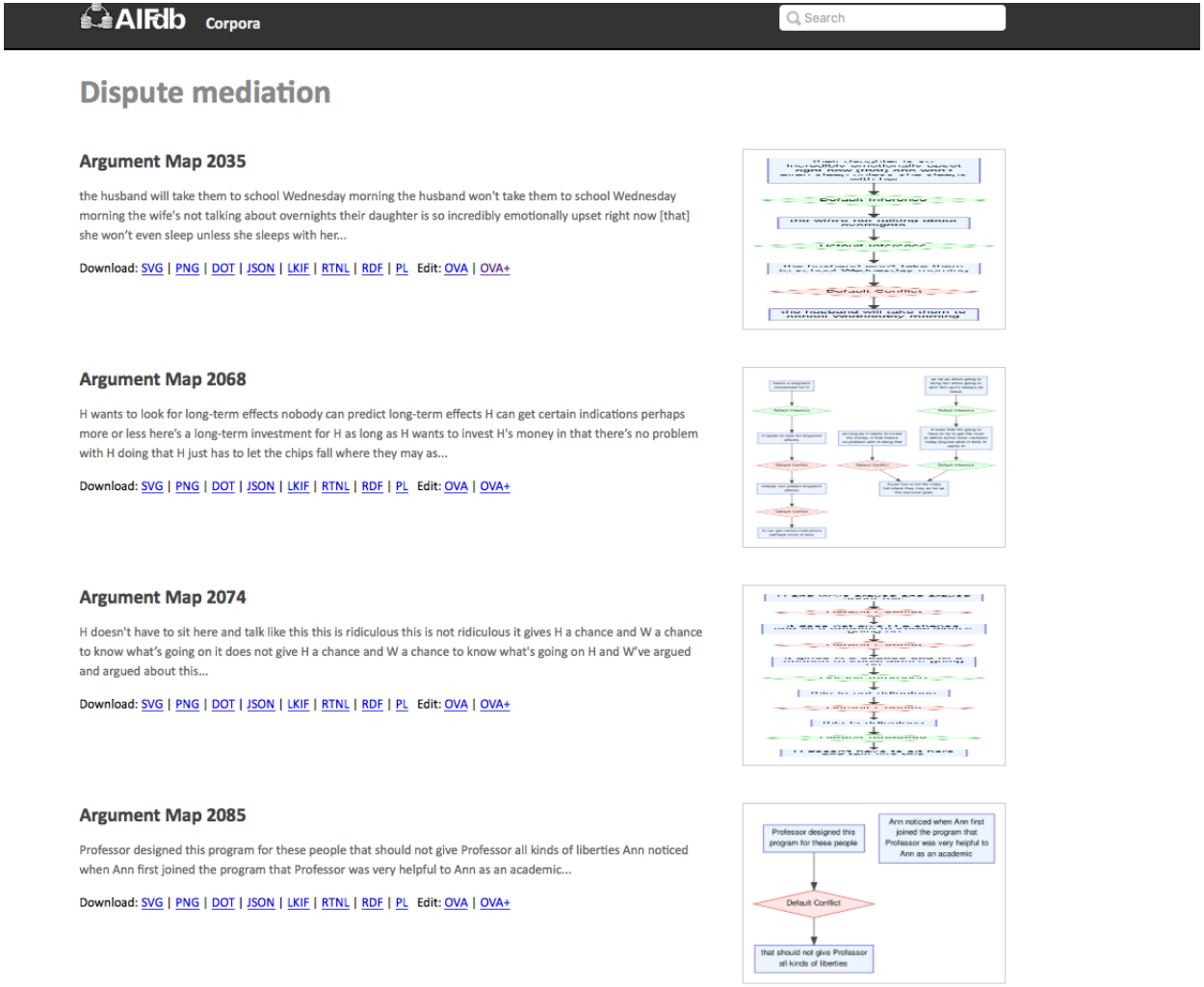

Figure 4.1: The DMC webpage

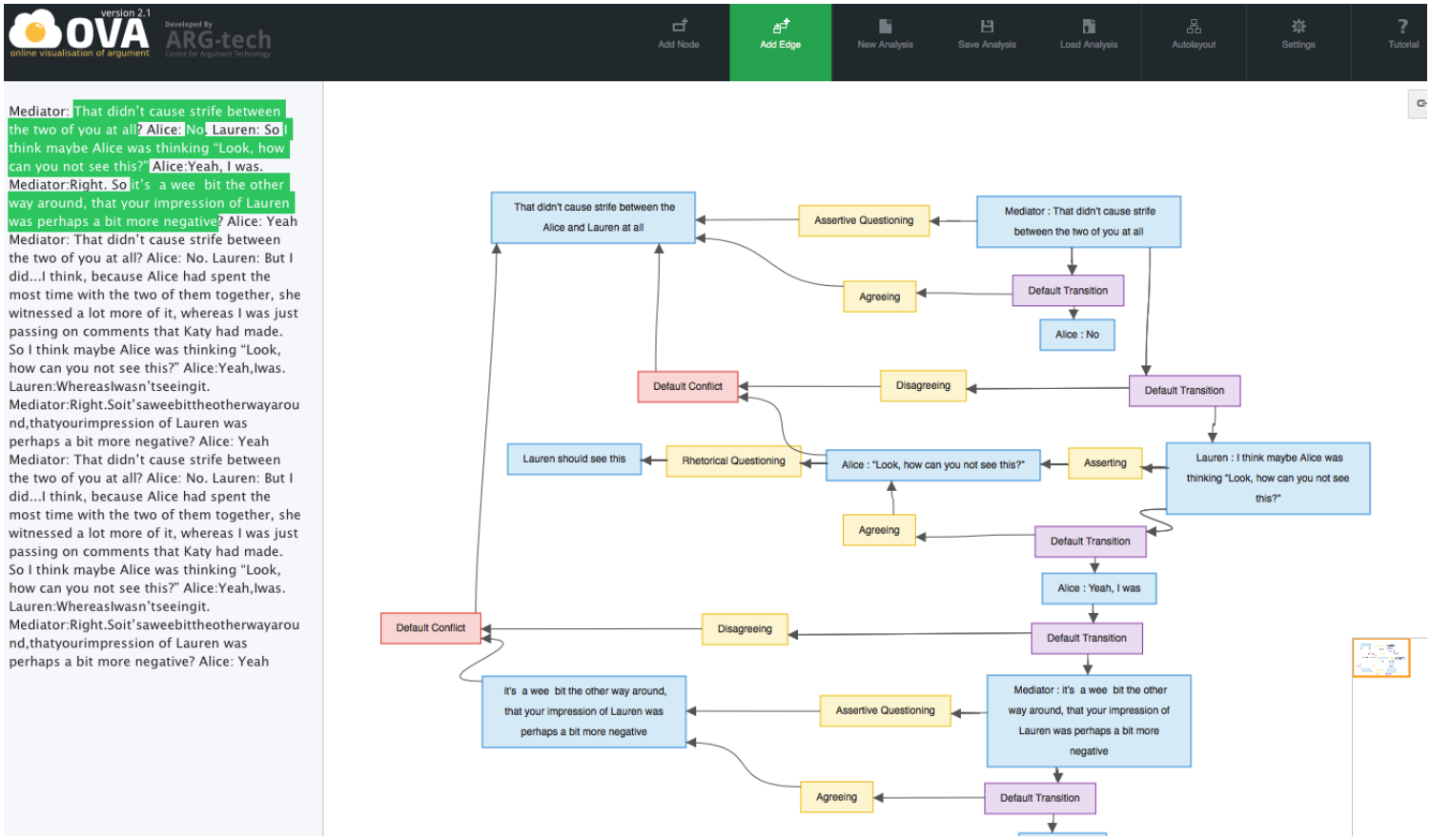

Figure 4.2: OVA+ analysis: Argument map # 10954

4.2 Analysing dialogical argumentative activity in mediation discourse with Inference Anchoring Theory

An extended presentation of the mediation process and mediation characteristics has been given in Chapter 2. The current work focuses on studying the argumentative process in mediation dialogues (i.e. how the discussion between conflicting parties and mediators forms an argumentative discourse), and relates it with argumentation technology (i.e. computational formalisms and models). Research on the link between mediation and argumentation is not new, as Section 2.4 has shown, but the relation to computational models has been little explored. Indeed, despite some works of research focusing on the argumentative activity in mediation (e.g.(Greco Morasso, 2011; Aakhus, 2003; Jacobs and Aakhus, 2002b; Greco Morasso, 2008; Greatbatch and Dingwall, 1997; Jacobs, 2002)) there has been no attempt (to my knowledge) to relate the dialogical tactics to the argumentative structure in this particular context with the aim of supporting this growing professional area (see Section 2.5).

The study of argumentative and dialogical dynamics in mediation must therefore rely on systematic analyses of the discourse. Tools for close analyses of mediation discourse are needed in order to explore the argumentative activity in depth, and ultimately get an accurate image of how dialogues unfold in this context. Namely, a close analysis of mediation discourse to detect where, in what way and why mediators deploy a particular strategy (i.e. a mediators' argumentative action) is needed. Here, the IAT framework, already tested in Chapter 3, is used to account for dialogical moves in order to derive the argumentative structure.

IAT is a flexible model which relies on different argumentation and discourse theories concepts; for instance, it is possible to identify argumentation schemes and illocutionary forces. It has been applied to different argumentative contexts (see (Budzynska, 2013; Budzynska et al., 2014c,b)). These different discursive contexts present their own features which IAT has put into relief thanks to its capacity to integrate several annotation schemes. As the research reported here has progressed, it has been necessary to incor-

porate new analytical features to the model in order to capture many important dynamics proper to mediation discourse. For example, the basic illocutionary connections used to analyse radio debates missed to grasp some speakers' intentions and a wider range of illocutionary forces is used to analyse mediation discourse; also, an additional scheme for similar propositional contents, which do not fall in the categories of Default Inference and Default Conflict, has been proposed. Consequently, the IAT annotation schemes for mediation discourse has fundamentally been developed as the research presented here has proceeded.

The present chapter will be illustrated with excerpts taken from a mock-mediation transcript; the analyses of the examples can be consulted at `corpora.aifdb.org/mockmediation`. This document is a 45-page transcript of a mock mediation session provided by Dundee's *early dispute resolution* team (see Section 4.1). In the form of a DVD, this document was originally created for training mediators and involves graduated mediators. For this reason, the case presented and the mediation are realistic and can be exploited for the fulfilment of the task. The mediation captured in the transcript involves two parties, Viv and Eric, and two mediators, George and Mildred. In this mock mediation session, Viv initiated mediation because she is not happy with the way her boss Eric regards her work and she wants more acknowledgements. Although the transcript only captures a part of an entire typical mediation procedure, many relevant characteristics of the process can be revealed (e.g. how mediators suggest arguments, how they deal with impasses, etc.). Therefore, all the analysed excerpts come from face-to-face mediations because, even if face-to-face mediation and online mediation aim at the same goal and present several common characteristics (see Chapter 2, Section 2.5.2), the work presented here is primarily interested in natural and direct dialogues. This does not mean that the findings reported here only apply to face-to-face mediation dialogues since some dialogical dynamics may also appear in online contexts.

Starting with an evidence-based approach, the analyses in the current Section 4.2 of some of the most common and most important phenomena will show the argumentative structure and will reveal characteristics proper to mediation discourse. Section 4.3 describes mediation argumentative discourse in an attempt to unpack mediation dialogue in

a simple way. Section 4.4 concludes the chapter and presents some of the next steps for future work.

In Chapter 3 we have seen that IAT is well-suited for the exploration of dialogical argumentation and permits highlighting and explaining some discourse dynamics. This section gathers IAT analyses of the transcript described above in order to get a clear view of the details of the argumentation process in dispute mediation. With a better insight into the argumentative structure, it will be easier to find out whether argumentative moves specific to mediation can be easily detected and differentiated, in which case it will be possible to model them for a later implementation.

The excerpts analysed below have been chosen because they have been identified as key characteristics of mediation discourse (see Chapter 2, Sections 2.1.1 and 2.4). The identification of these characteristics and strategies was indeed inspired by different research domains. For example, the notion *argumentation stage* is borrowed from pragma-dialectical theory (van Eemeren and Houtlosser, 2003) (see e.g. Section 2.4); the notion *option generation* was introduced in conflict resolution theory (see e.g. Section 2.1.1); and the notion *impasse* comes from communication studies (Aakhus, 2003) (see for instance Section 2.4).

All the IAT analyses below have been produced using OVA+ (Janier et al., 2014b), the interface for the analysis of arguments online presented in Chapter 3 and Section 4.1.3. The analyses presented in this chapter, are available in the DMC (see Section 4.1); for zoomable figures, please consult the analyses online at `arg-tech.org/AIFdb/argview/xxx`, where xxx must be replaced by the argument map identifier given for each IAT analysis presented throughout; click then on **Menu** and **Edit with OVA+** to access the original analysis.

4.2.1 How mediators pave the way to the argumentation stage

As we have seen in Chapter 2 and Section 2.4.1 in particular, the mediation process presents all the features of a *critical discussion* as all the stages of a critical discussion can be delineated in mediation. This idealised model has significant limitations in handling the complexity of natural language argumentation but its broad structure is useful as it pro-

vides a scaffold for close investigation. We have seen that mediators must lead disputants from the confrontation and opening stages to the argumentative stage (i.e. from a mere disputative situation to a discussion in which parties will try to resolve their conflict). In the mock-mediation transcript, Example 4 captures the moment when the mediator, George, asks the disputants to explain why they feel they are in conflict.

(4) a. Eric: *I'm genuinely confused about what Viv is accusing me of.*

b. George: *Okay. All right. So would you be happy…Just to carry on, Viv, would you [be] happy if Eric used that as a starting point, for a couple of minutes, to explain how he thinks and how he feels? And then you'd have the same opportunity.*

c. Viv: *Yes, that's fine by me.*

d. […]

e. Viv: *Well. Where to start? I just feel that any suggestions I make, you're constantly questioning what I do.*

f. Eric: *I don't think [that's] quite fair really. Because, after all, it's a new job; and you're just into what's a very complex organisational process that we run here; and you can't expect just to be able to come in and just start off right away. If you make a mistake or something, you know what the position's like: you have to go back to square one…*

This part of the mediation can be considered as the beginning of the *argumentation stage*. After Eric says he does not know why he has to take part in the mediation, George asks Viv to give her opinion, and parties then start to discuss and argue. This is shown in Figures 4.3 and 4.4[23].

[23] 4d has been deleted; it is a passage in which Eric explains he would rather Viv to start giving her opinion because he is too confused.

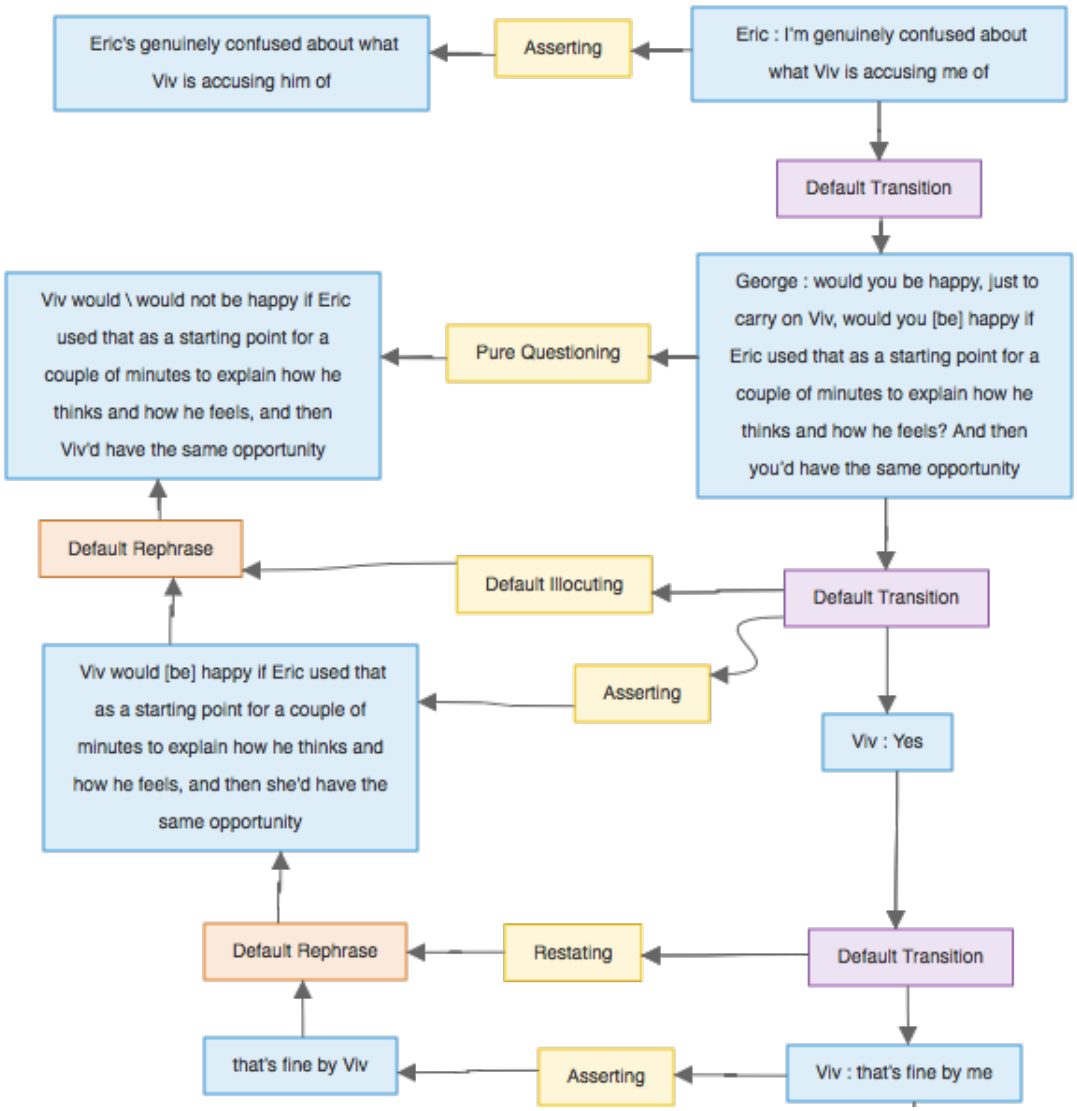

Figure 4.3: Beginning of the argumentation stage, analysis of turns 4a to 4c- Argument map # 11018

Figure 4.3 shows that after Eric asserts that he is confused, the mediator asks a Pure Question. Viv answers the mediator's Pure Question by "Yes", which means that she *is* indeed happy with what the mediator proposes. As we have seen in Chapter 3, answers to Pure Questions are not agreement or disagreement: they rather show whether a speaker (the answerer) is committed or not to the proposition of the questioner. Answers to Pure Questions are therefore a sort of Rephrase of the content of the questions. Here, for instance, George's questions can be viewed as having two propositions: Viv would be happy and Viv would not be happy. Answering "Yes", sounds as if Viv had made a choice between both propositions, and had therefore asserted that she "would be happy [...]". In IAT, the relation *Pure Question / answer* is captured by the generic illocu-

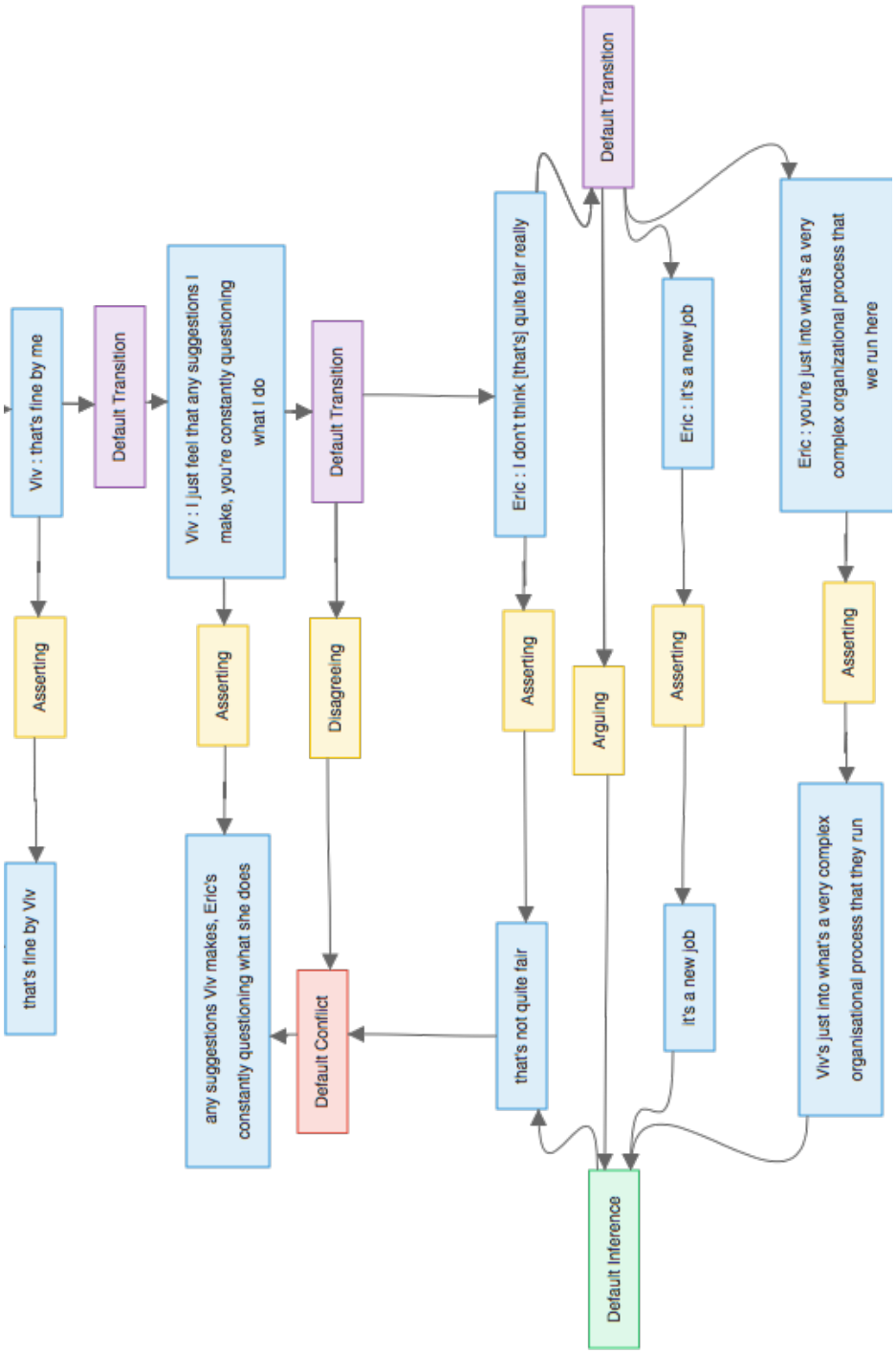

Figure 4.4: Beginning of the argumentation stage, analysis of turns 4c to 4f - Argument map # 11018

tionary connection Default illocuting, which must target a Default Rephrase node, which itself represents the link between the propositional content of Pure Questions, and the (sometimes reconstructed, as in this example) propositional content of the answers.

We can see in Figure 4.4 that Viv's next move is an Assertion which is also a Rephrase of her answer: "that's fine by me" is related to her previous move via a Default Rephrase node. The link between two Rephrased contents is captured by the illocutionary force of Restating. The definition of Restating has not been given before in Chapter 3 since this illocutionary connection has been proposed as the framework kept evolving with, among others, more and more analyses of mediation discourse being produced. Following (Konat et al., 2016), the type of relation between propositional contents which – more or less – slightly differ linguistically, and are not inferentially connected is represented in IAT by Default Rephrase nodes which anchor the illocutionary connection Restating.

Then, at turn 4e, Viv answers the Pure Question with an Assertion, and at turn 4f Eric asserts another proposition. This proposition is in conflict with Viv's answer to the Pure Question: Eric disagrees with her. He then asserts two other propositions which together play the role of premises for the conclusion "that's not quite fair".

This example, and its analysis, show that this dialogue is the beginning of the argumentation stage in the mediation transcript: after a party said that he was confused about attending mediation, the mediator asked a Pure Question which has led disputants to give their points of view and start arguing and counter-arguing on the issues they are concerned about.

4.2.2 How mediators redirect the discussion and pave the way to the option generation

Redirection is a mediation strategy (see Section 2.4.2) through which mediators shift the focus of the discussion when the dialogue between parties is blocked or leads nowhere (Aakhus, 2003). In the transcript, Mildred redirects the discussion in the following excerpt, as is shown by Figures 4.5 and 4.6. Option generation is usually the moment when mediators ask disputants to provide one or more propositions they think could solve their conflict (see Section 2.4.1).

(5) a. Eric: *It's just making my life a misery, actually and that's the way things are at the moment.*

b. Viv: *I'm sorry.*

c. Eric: *I'm sorry if that's the way it comes over, but you want me to be honest, so that's the view and that's kind of the way it is.*

d. Mildred: *What would you like out of today?*

e. Eric: *Well, I would like Viv to become part, a productive member of the team. Because we are a team and, you know, Viv was appointed to be my equal.*

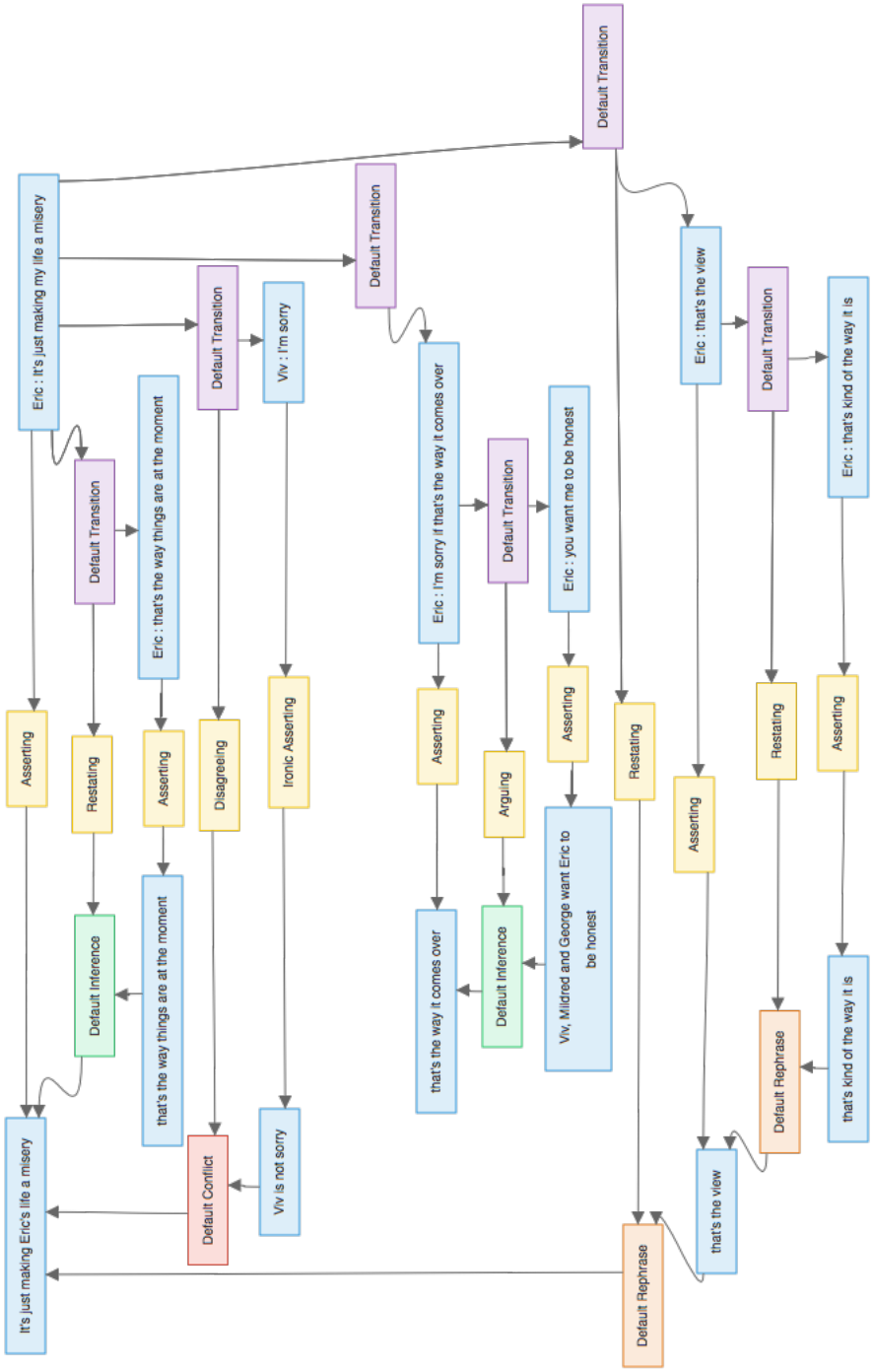

Figure 4.5: Redirection, analysis of turns 5a to 5c - Argument map # 11020

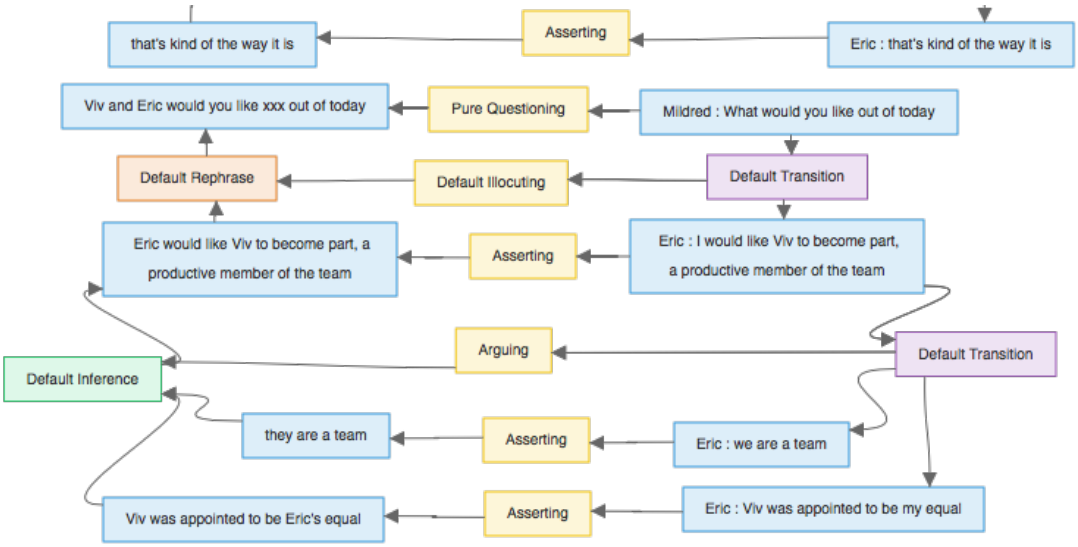

Figure 4.6: Redirection, analysis of turns 5c to 5e - Argument map # 11020

In this excerpt, Viv shows she does not agree with Eric by saying, ironically, "I'm sorry"[24]. Ironic Asserting is rare in the two dialogical contexts studied so far (that is, the Moral Maze radio debates – no instances found – and mediation – only 5 occurrences). Ironic Assertions are defined as Assertions, the propositional content of which is the opposite of what is said. Viv does not bring more arguments to support her disagreement: the parties are just talking angrily and the discussion does not move forward. Eric, indeed, then argues but does not answer Viv (see that the Transition node of turn 5c is not linked to Viv's locution, but to Eric's first move), and he only restates his own propositions. The mediator's question, however, unblocks the situation since Eric gives his opinion and argues. Note the absence of a transition node between the mediator's question and the locutions above; this explicitly shows that there is no link between them: the mediator changes the topic and brings in an all new issue. The following of the discussion, that is, Eric's last move, is the option generation: Eric gives his opinion (*"I would like Viv to become part, a productive member of the team."*) and provides arguments to support his claim. Indeed, the mediator has managed to set up an argumentative space and does not have to ask the parties to specify their grounds. This statement is actually the first *option*, i.e. the first available possibility to solve the conflict.

Figure 4.6 shows that the same Pure Question has allowed the mediator both to redirect the discussion (the absence of transition node shows there is no relation with the content of

[24]The irony is obvious in the audio of the session; here, with text only, the irony is less visible.

the prior moves) and to trigger the option generation stage (Eric says what he is expecting and provides arguments).

4.2.3 Sources of impasses and mediators' strategies to deal with them

We have seen in Section 2.4.1 that impasses are tricky moments when disputants are not reasonable. As a consequence, the dispute escalates and nothing constructive emerges from the disputants' discussion. Mediators must therefore intervene and try to unblock the situation. Two types of sources of impasses (as identified by Aakhus (2003)) have been found in the transcript: *negative collateral implications* (Example 6) and *unwillingness to be reasonable* (Example 7).

(6) a. Eric: *I'm just a bit reluctant to hand over to Viv at this early stage, because of the complexity and if you make a mistake, you waste such a lot of time. But I don't know whether Viv thinks that she's up to it or whether you think you could handle that project.*

b. Mildred: *What about if we perhaps separate it, had a bit of time and we spoke with each of you to look at the finance project?*

In Example 6 Eric says that he does not want to hand over one of the projects to Viv because the task is very complicated. The first sentence highlights the complexity of the task and the cost of mistakes which could result from handing the project over to Viv too soon. The second sentence pushes the choice away from Eric to Viv, as though he is not the one to take the responsibility for the decision. Both sentences though seem to carry the implication that Viv is either not qualified or not yet ready, or both. The mediator then opens a conversation which avoids this direct conversation and instead shifts the topic of the discussion from whether Viv is qualified and whether Viv or Mildred should decide whether Viv is qualified, towards discussing the task itself and the expectations around it. Thus Viv's competence is taken out of the discussion. Let's analyse this excerpt in Figure 4.7.

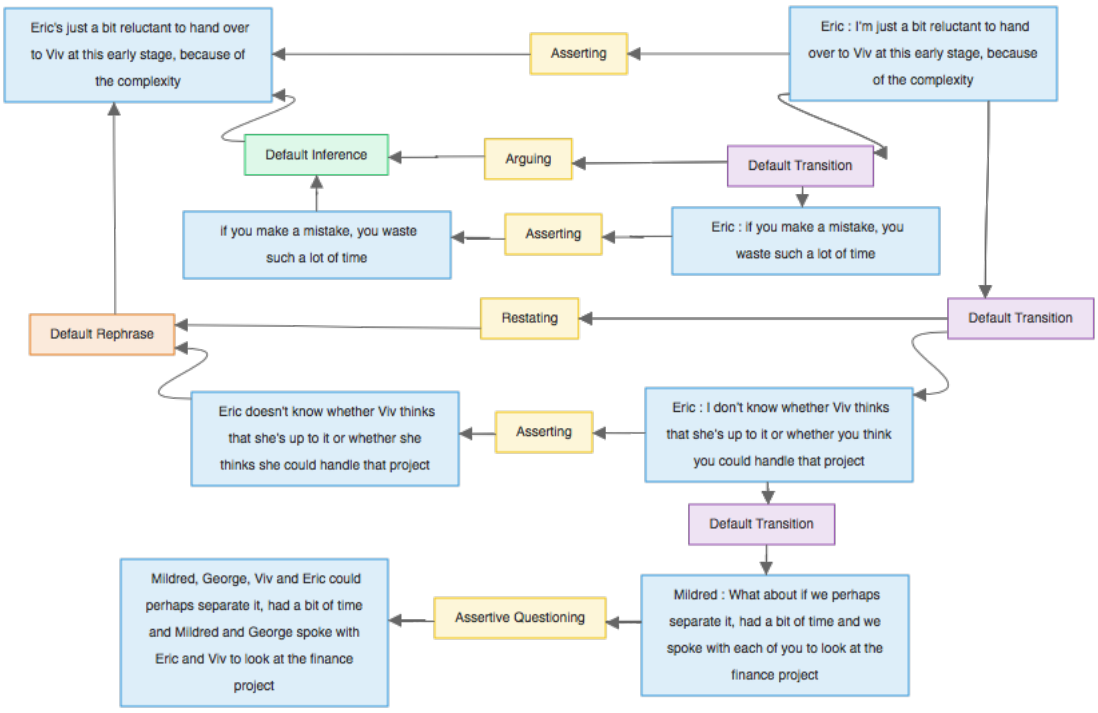

Figure 4.7: Negative collateral implications - Argument map # 11021

The use of IAT to analyse this extract allows for the detection of the different moves corresponding to the source of impasse and to the mediator's moves to deal with it. Here, Eric casts doubts about Viv's capacities and provides an argument for this (see the illocutionary force of *arguing* between his two first locutions). However, it does not make the discussion move forward since the other party, Viv does not answer to those criticisms: this is the impasse, further demonstrated by the fact that Eric repeats his criticism: his last move is restating the first propositional content. Jacobs and Jackson (1992) describe this frequent situation in dispute mediation i.e. when the parties make claims which have potential argumentative strength but their relevance is lost as they appear in a moment when they do not serve the argumentative process. Here, Eric's argument is irrelevant considering the current discussion. The mediator is supposed to detect this and to restore the argumentative relevance (van Eemeren et al., 1993). This is what Mildred does in this extract: her question shifts the topic and gives her, at the same time, the possibility to propose a new way to broach the issue. This move is not surprising given it is acknowledged that most of the mediators' moves consist in asking questions. It must be pointed out that the question appears as a very procedural comment (or meta-comment) on how to proceed with the discussion. It is very directive: we feel that the mediator not only wants to know

what the parties think about what she proposes (reflected by the question), but she somehow claims that this is how the discussion should unfold (reflected by the assertiveness of the question). The mediator has actually *temporised* the discussion (see Section 2.4.2 and (Aakhus, 2003)): the question creates a space for a new conversation which focuses the discussion on a new way of tackling the issue. Contrary to redirection (cf Figures 4.5 and 4.6), here there is Transition node between her question and the previous locutions: this means that this question still is related with what was said before, but the absence of links in the argumentative structure shows that, with this question, the mediator wants the discussion to move forward and does not take into account what Eric said.

The third locution of Eric could be interpreted in two different ways. It is here analysed as a way for Eric to say that he will not take responsibility if Viv fails with the project. With this interpretation, there is obviously a link between Eric's first locution and the third one: he is reluctant and he does not want to take responsibility are Rephrases. This locution could nonetheless be seen as a second support (premise) to Eric's reluctance: he is reluctant (first locution) because you waste a lot of time if you make mistakes (second locution) and because he does not know if Viv feels she has the ability to handle it (third locution). Both interpretations are possible and correct, and they do not change the following of the analysis.

(7) a. Eric: *I don't know whether Viv could handle... that she has the ability.*

b. Viv: *Well, come on! You employed me. Surely you thought I had the ability to... you know... But...*

c. Eric: *Well, I did. So there is a way forward then. But I can also check on how she's doing the project, and if she's succeeding with it. And that will give me a milestone, an indicator of her.*

d. Viv: *I would quite like to just maybe take time out to look at what my job description was, actually. And from that, given what we've been talking about, it might signal up to me the key points that I want to clarify with you and see what your opinion is.*

e. George: *It's quite possible.*

Example 7 is the discussion between Eric, Viv and George; it happens some time after

the one in Example 6. Here, Eric again casts doubts about Viv's ability to handle the project. However, this time, Viv answers to the criticism and claims that he employed her because he knew she was able to deal with it. Eric agrees with her but he does not take it into account and claims that he needs to check if she actually can handle the project. Viv does not directly answer this; rather, she proposes to have a look at her job description to check whether she understood what Eric expected from her. The mediator intervenes only then, by saying that Viv's proposal is a good idea. For clarity purposes, the IAT analysis of this excerpt is presented in two separate figures.

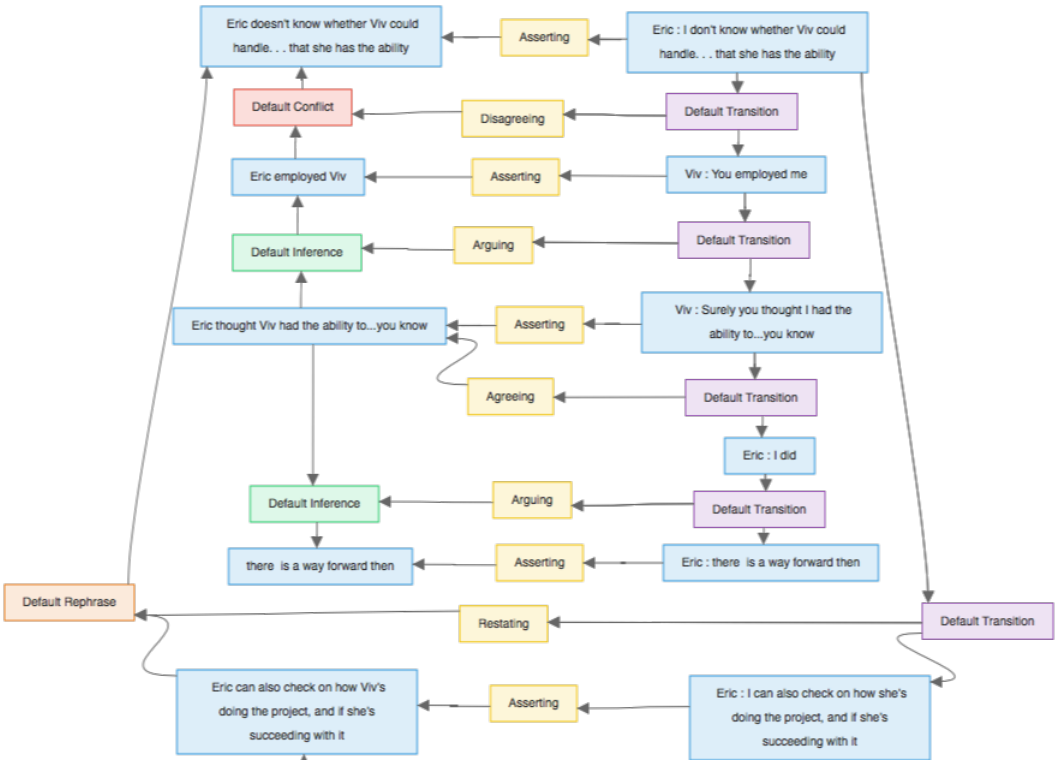

Figure 4.8: Unwillingness to be reasonable - Analysis of turns 7a to the beginning of 7c - Argument map # 11023

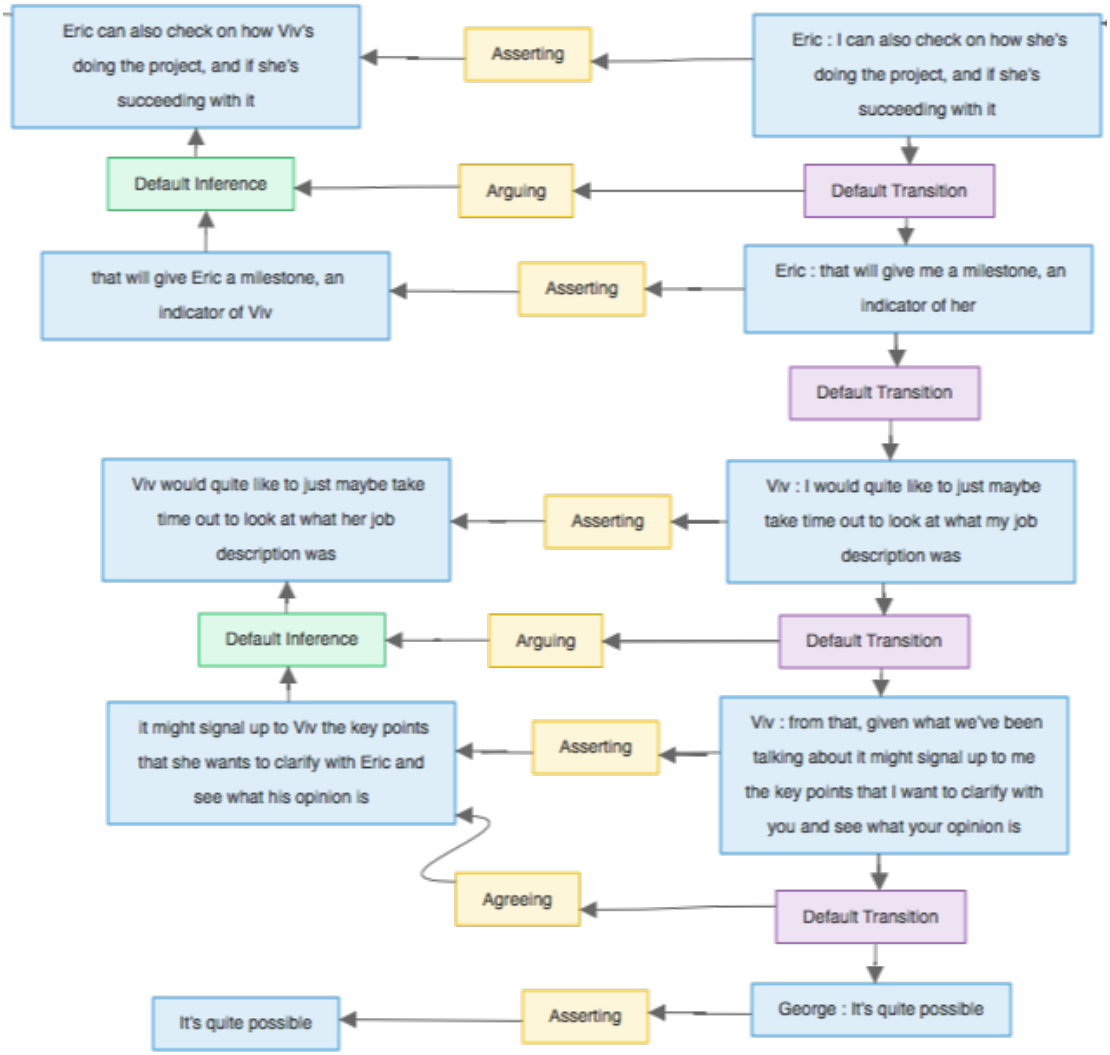

Figure 4.9: Unwillingness to be reasonable - Analysis of the end of turn 7c to the beginning of turn 7e - Argument map # 11023

The analysis in Figure 4.8 shows that Viv disagrees with Eric's first claim and gives an argument. Eric finally agrees with Viv and even argues (note that his argument takes Viv's last proposition as a premise). But then, he asserts another proposition which is a Rephrase of the first one. This is the impasse: Eric is unwilling to be reasonable since he agrees with his opponent but then refuses to take it into account, and insists on his first standpoint.

The following of the analysis in Figure 4.9 reveals that Viv then proposes to have a look at her job description and provides an argument for this suggestion. The mediator agrees with this proposal. Viv is therefore the one who reacts to the impasse, through temporising (Aakhus, 2003); she indeed proposes a temporary arrangement to tackle an issue (Eric's doubt on her capacity in handling the project) by having a look at her job

description. It must be noted that, in this case, it is a disputant who reacts when the source of impasse has appeared, while we would expect mediation strategies to be set up by the mediators. Greatbatch and Dingwall (1997) nevertheless show that disputants very often manage to put an end to discussions on some (irrelevant) issues without the intervention of the third-party. This is precisely what happens in Example 7.

4.2.4 How mediators clarify misunderstandings

We have seen that the mediators' primary role is to facilitate the communication between disputants and that sometimes a misunderstanding is at the origin of the parties' conflicts (see Section 2.1.1).

In Example 8, the mediator deals with and seeks to clarify a misunderstanding between the parties about their respective role in the team.

(8) a. George: *It strikes me you may have slightly different views about the role of, let's call it, Team Leader and Number Two.*

b. Viv: *Yes.*

c. George: *In gaining our experience when job descriptions are written down, they don't necessarily translate into what's written on the paper. What perhaps you intended and what perhaps, you believed. The other thought that occurs to me is that it might be useful at some point just to return to this whole thing of, either the job description or possibly what Mildred was just referring to, which is this notion of transition. You've both mentioned the idea that you're not going to be here forever, what's the point of this Number Two, so perhaps what might help is a look at how that transition might work, what you would like it to achieve. What Viv would like it to achieve and see how the two can be married together. Would that be a fair...*

d. Viv: *Yes, I think it's vital, actually.*

e. Eric: *I think it's all based on the job description*

George emphasises that Viv and Eric do not have the same views about their respective jobs. Viv seems to agree with that, and George goes on, proposing to have a look at what

Viv's job description is. Both parties agree. Let's analyse this example in Figures 4.10 to 4.12.

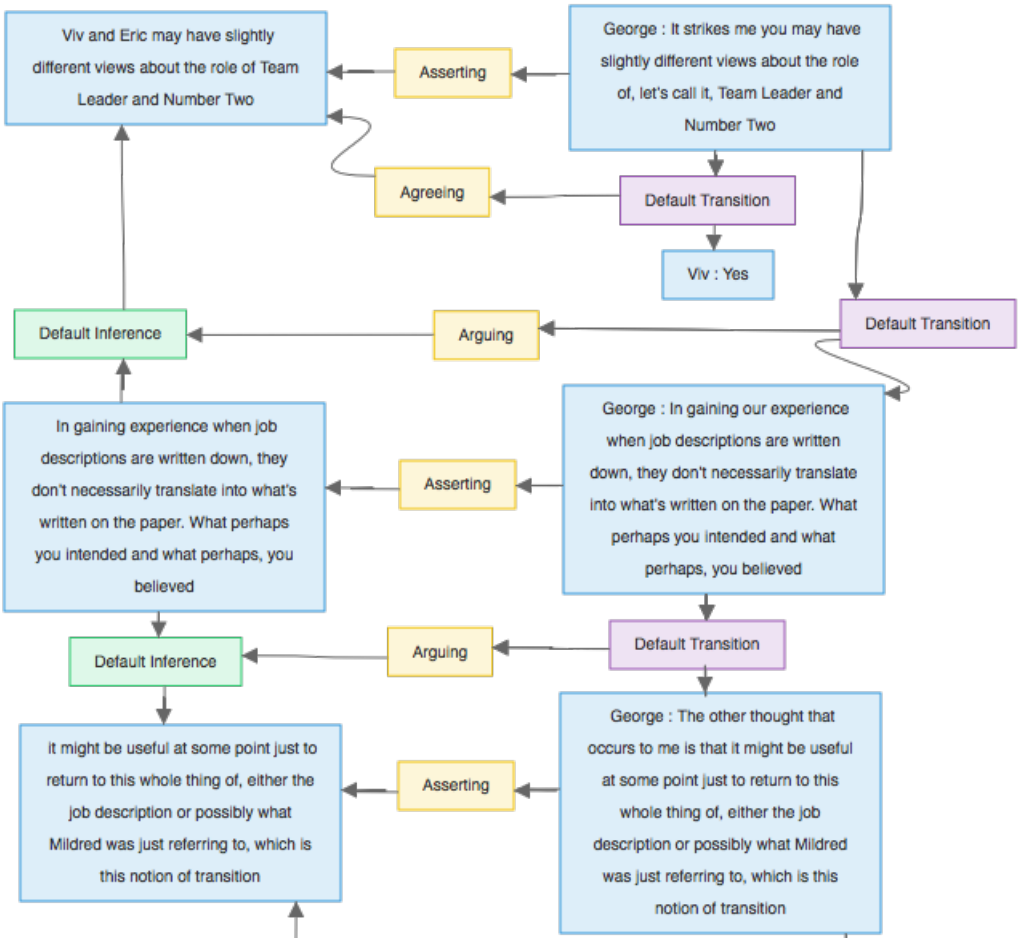

Figure 4.10: Clarification of misunderstandings - Analysis of turns 8a to the beginning of turn 8c - Argument map # 11024

The beginning of the analysis (Figure 4.10) reveals that the mediator first asserts a proposition which emphasises Viv and Eric's discrepancies and Viv agrees with the content of his Assertion. Then the mediator asserts two other propositions which create two arguments: the second proposition is at the same time a premise for the first propositional content and for the third one.

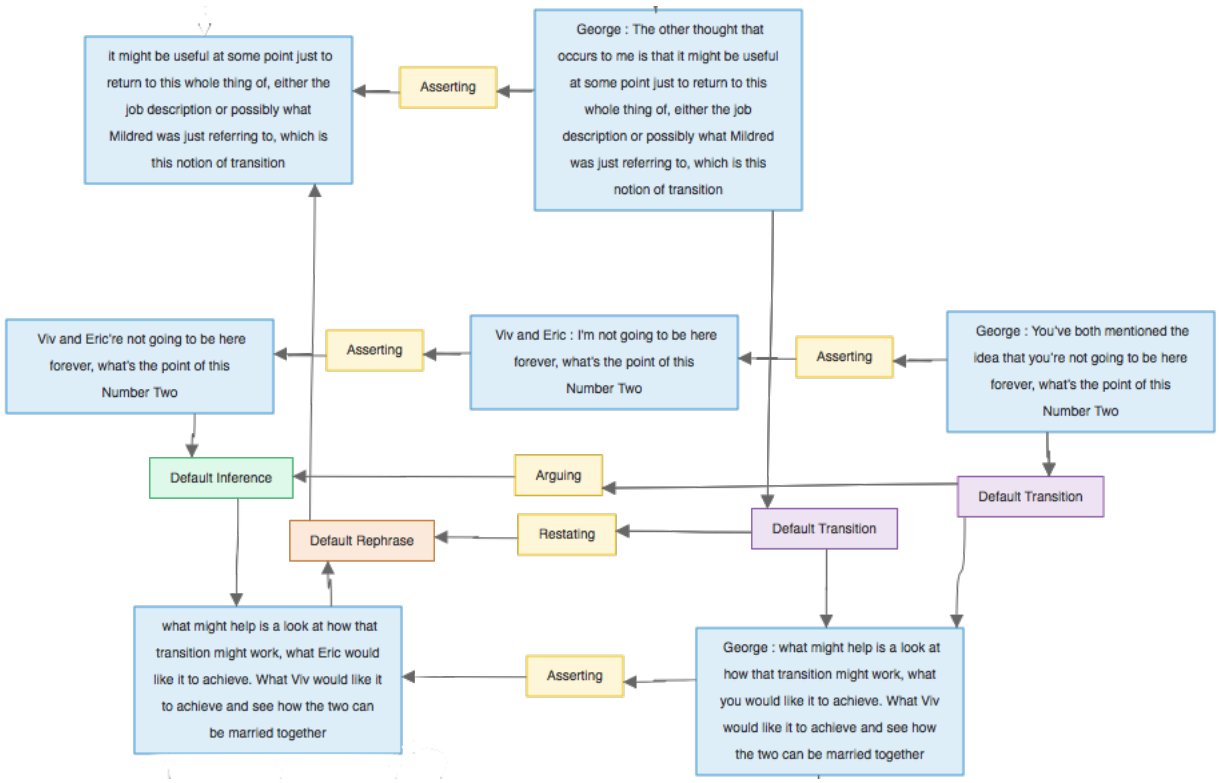

Figure 4.11: Clarification of misunderstandings - Analysis of the following of turn 8c - Argument map # 11024

In Figure 4.11, we can see that George then reports what both parties mentioned: he uses the device of reported speech, the propositional content of which allows him to build another argument. Indeed, he then asserts another proposition which, at the same time, restates his third proposition and is also inferentially related to the propositional content of the reported speech.

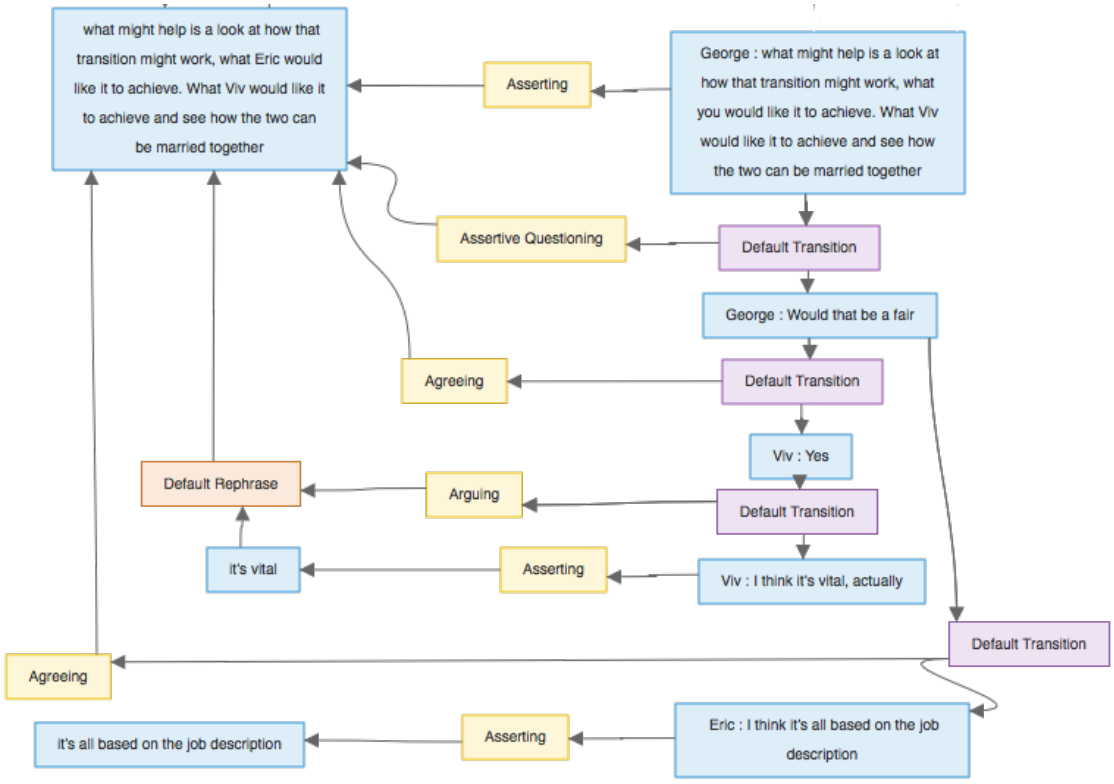

Figure 4.12: Clarification of misunderstandings -Analysis of the end of turn 8c to turn 8e - Argument map # 11024

In the analysis of the last moves (Figure 4.12) George asks the parties an Assertive Question, the content of which is his last Assertion. Viv agrees and asserts a proposition which acts as a premise for the content of George's last proposition. Finally, Eric also agrees with the mediator. The clarification of misunderstandings (that is about the disputants' roles at work) happens in several steps: first, the mediator tells the parties that they have different views on the issue, he then provides several propositions which support his opinion, including the parties' (supposed) words. Finally, after having made several claims, he asks an Assertive Question to verify whether the disputants agree with him. Given that they agree, we can say that he has clarified the misunderstanding or, at least, managed to made them aware of this misunderstanding.

This dialogue may seem surprising because the mediator appears very assertive and argues several times, while he is expected to be neutral and avoid these types of behaviour. However, it is interesting to see that most of his propositions in this dialogue concern the way to proceed in the discussion (having a look at the job description, talk about how the transition will work, etc.) rather than the dispute itself. He does not take position on the

parties' standpoints but on the way the discussion should unfold. Such types of moves (that is, arguing about the shape and content of the discussion) are mainly studied in relation with meta-discourse i.e. discourse about discourse. This finding also supports Greco Morasso's claim that the assertiveness of mediators very often relates to the management of the discussion, which does not jeopardise their neutrality (Greco Morasso, 2011, p 175) (see also Section 2.4.2). The use of meta-discourse in mediation dialogues deserves particular attention, as will be shown in Chapter 7.

4.2.5 How mediators suggest arguments

We have seen in Section 2.4.2 that mediators generally suggest arguments (in the sense of standpoint) by means of questions (Jacobs, 2002; Aakhus, 2003; Greco Morasso, 2011). Questions provide mediators with a weaker burden: by pure-questioning, a speaker does not commit herself (see Chapter 3); on the contrary, the response to a question does commit the speaker. Thus, if a mediator asks a question, the party will be the one claiming a standpoint via the answer. Also, as argued by Jacobs (2002), questions have a high argumentative potential because they suggest that the response is non-obvious and can be challenged.

The next example is closely related to Example 8 above: in Example 9, the mediator suggests an argument, which, as we will see, is more about the shape and content of the discussion rather than the dispute.

(9) a. George: *The one main interesting point I noticed, both of you were concerned about the team. You very much want to be part of the team; you want to be seen to be adopting a role that's valued within the team. The team is something you've built up over the years.*

b. Eric: *That's right.*

c. George: *It's something that you value; it's what makes . . .*

d. Eric: *It's my team.*

e. George: *It's your team, exactly.*

f. [. . .]

g. George: *There are obviously discussions that need to happen around the team. Would that be a fair statement?*

h. Viv: *Yes.*

The example is analysed in Figures 4.13 to 4.15.

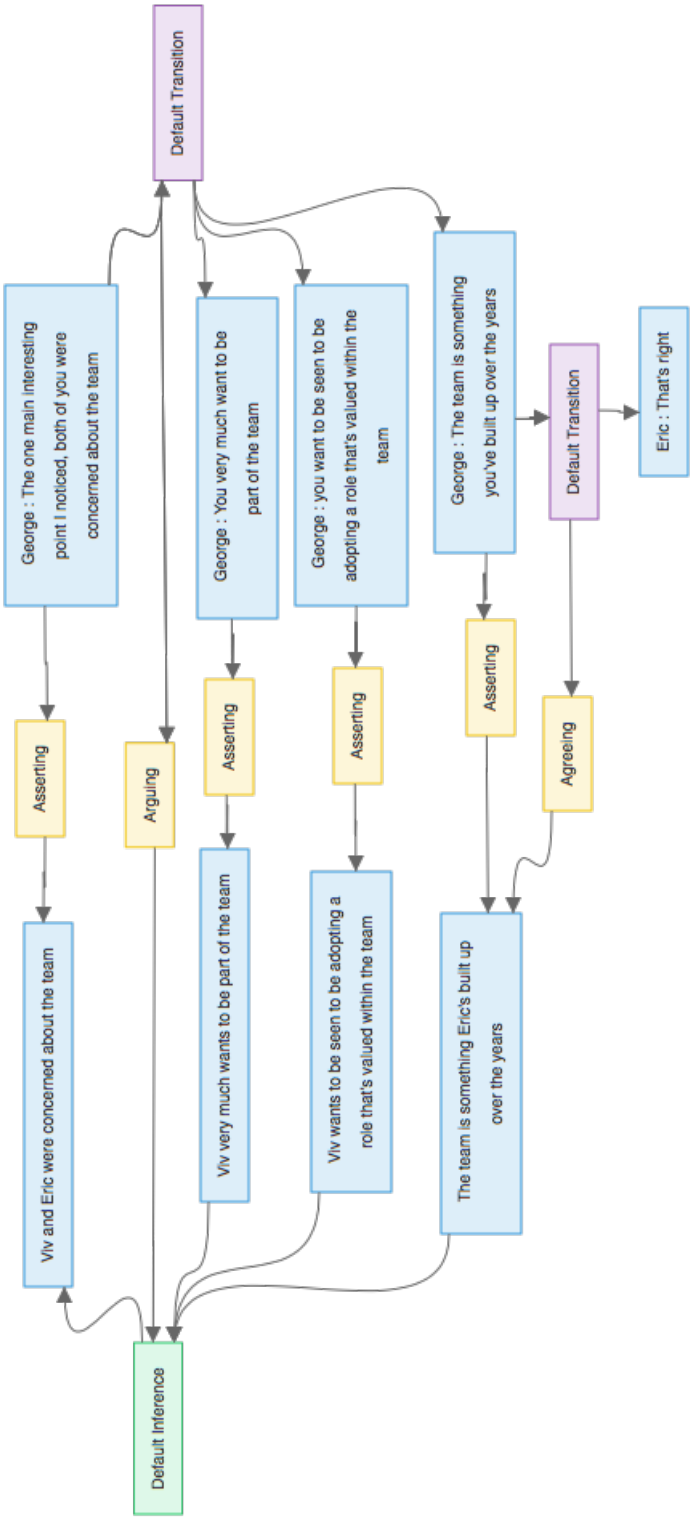

Figure 4.13: Suggesting an argument - Analysis of turns 9a and 9b - Argument map # 11026

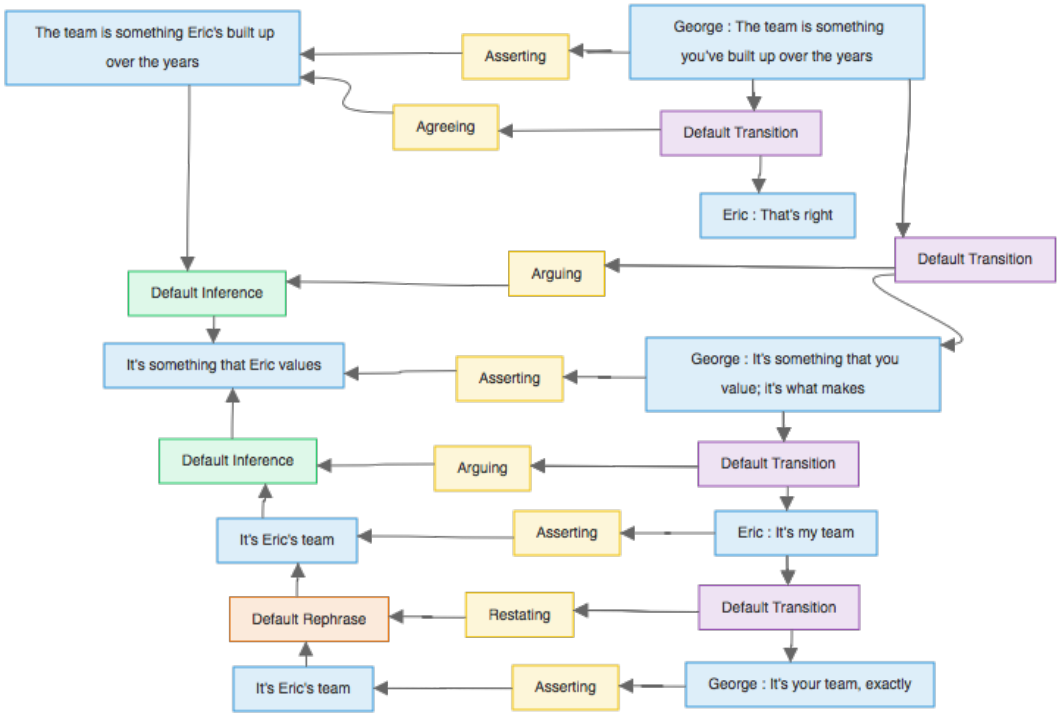

Figure 4.14: Suggesting an argument - Analysis of turns 9c to 9e - Argument map # 11026

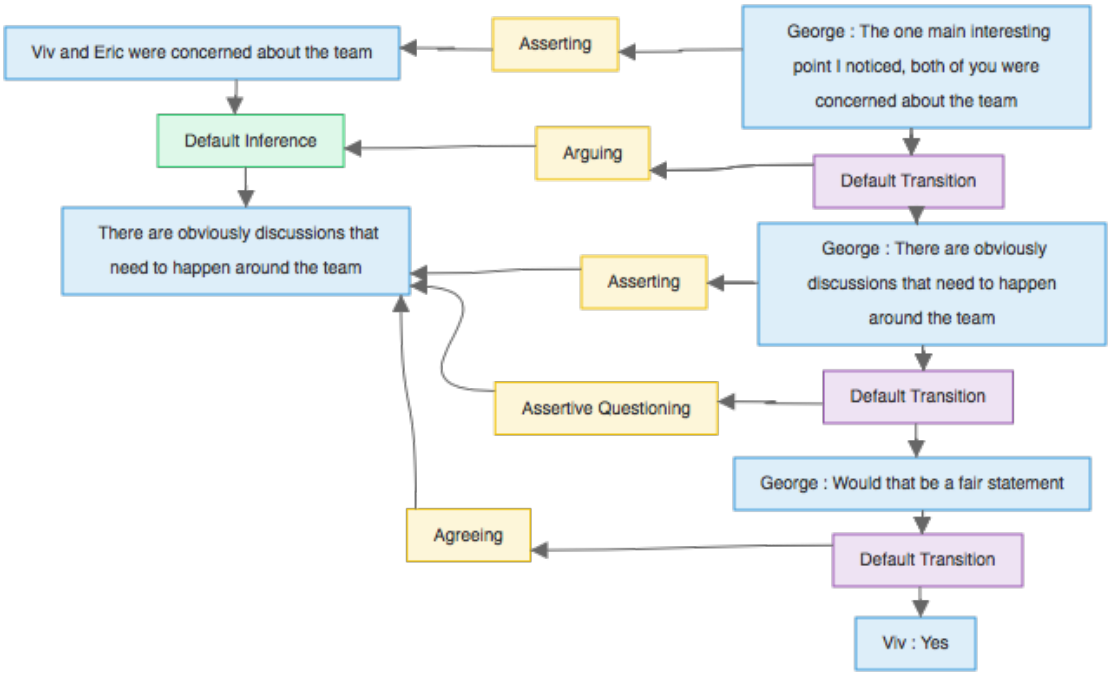

Figure 4.15: Suggesting an argument - Analysis of turns 9a, 9g and 9h - Argument map # 11026

In the first figure, one can see that, similarly to the previous example, the mediator is arguing, and Eric agrees with one of the mediator's propositions. In the second figure, the mediator keeps arguing, and Eric also argues (he uses the mediator's proposition to build

his own argument), and the mediator restates Eric's premise. Finally, in the third figure, we can see that at turn 9g, the mediator first builds an argument, by taking his first proposition at turn 9a to be a premise for the conclusion that "there are obviously discussions that need to happen around the team". He then assertive-questions the disputants to check if they agree with such a statement, and Viv answers the question by "Yes", which means that she agrees. George therefore has stated, among other propositions, that the disputants should talk about the issue of the team, but the following question is useful both to let the utterance seem more like a proposition than a proper claim. Most of all, this claim is about an issue which has to be tackled: once again, the mediator is only taking position on the topic to be addressed, and not on the dispute itself. The IAT analysis of this dialogue highlights very well the mediators' role: they subtly make suggestions on the issues to be broached and even more subtly draw conclusions which can act as premises for the continuation of the parties' discussion.

As argued by Jacobs (2002), as part of their training, mediators learn how to re-state disputants' standpoints. They do so by asserting. This helps to clarify and report parties' standpoints, restructure or summarise the discussion. Given these functions, the mediators' statements cannot be considered as standpoints and therefore their neutrality is not challenged. This argument is supported by the analysis of Example 9.

4.3 Mediation tactics and strategies

The application of IAT to mediation discussions has allowed the analysis of the structure of mediation discourse in the main dialogical situations which the literature on the subject had hitherto identified. The analyses present the argumentative elements of mediation discourse in a graphical manner; the detection of these elements is necessary for associating a sequence of utterances (or tactic) to a particular situation or strategy. In other words, starting from a fine-grained analysis of the discourse structure, provided by IAT analyses, it is now possible to define larger scale dialogue and argumentative structures which can be examined and modelled, for later implementation in software. It is then possible to associate a sequence of argumentative and dialogical moves to a mediation discourse feature. Namely, excerpts of mediation dialogues are examined in detail

and their discursive characteristics identified. For instance, a source of impasse identified in a mediation dialogue is analysed, and the discussants' argumentative and dialogical behaviours are described with IAT in order to determine the speakers' discursive tactics to deal with the impasse. Consequently, it is possible to accurately define the speakers' tactics (i.e. their argumentative and dialogical behaviours) when they set up a particular strategy (i.e. discursive features which allow them to manage the discussion).

Table 4.2 to Table 4.7 summarise the tactics for the five strategies occurring in mediation which have been described in Section 4.2: *opening of the argumentative stage*, *redirection*, *option generation*, *clarification of misunderstandings*, *dealing with negative collateral implications*, *dealing with unwillingness to be reasonable* and *suggesting arguments*. These tables are a first step towards formally representing what the analyses in Section 4.2 depict. Every feature highlighted by the graphs is reported in the tables below. This formal representation, inspired by Mackenzie, Walton and Krabbe, and Prakken's studies on persuasion dialogue systems (Mackenzie, 1979; Walton and Krabbe, 1995; Prakken, 2006, 2005), can be processed to ultimately derive a dialogue-game protocol proper to mediation. This is a necessary step for further studies or applications, such as the development of software to support mediation activity.

The first columns in the tables indicate the strategies at stake. As an example, in Table 4.2 the strategy of opening the argumentation stage happens at Loc_2 and the following moves are the argumentation stage. The second columns represent the locutions and transitions in order of appearance in the analyses (e.g. Loc_1;Loc_3 means there is a transition node from the first to the third locution). In the third columns, P_1 and P_2 stand for Eric and Viv respectively; *mediator* is used without distinguishing Mildred and George. The illocutionary forces corresponding to the locutions and the ones anchored in the transitions appear in the fourth columns; ø is used when no illocutionary force is anchored in a transition node or when there is no propositional content. The letters in the fifth columns symbolise the propositional contents of each locution (a different letter for each different propositional content). Note that every table is independent: e.g. if the letter *a* appears in one single table, it symbolises a purely identical propositional content; this is not the case if *a* appears in Table 4.2 and in Table 4.3 for example. The notation *Conflict (a ; b)* means

that there is a conflict from *a* to *b*; similarly, *Inference ([a ; b] ; c)* means that both *a* and *b* support *c*.

4.3.1 Paving the way to the argumentation stage (Section 4.2.1)

Table 4.2: Tactics for paving the way to the argumentation stage

Discussion situation	Locution or transition	Participant	Illocutionary connection	Propositional content
Opening stage	Loc_1	P_1	Asserting	a
Opening the argumentation space	Loc_1 ; Loc_2		ø	ø
	Loc_2	Mediator	Pure Questioning	b
	Loc_2 ; Loc_3		Default Illocuting	Rephrase (c ; b)
	Loc_3	P_2	Asserting	c
	Loc_3 ; Loc_4		Restating	Rephrase (d ; c)
	Loc_4	P_2	Asserting	d
Beginning of the argumentation stage	Loc_4 ; Loc_5		ø	ø
	Loc_5	P_2	Asserting	e
	Loc_5 ; Loc_6		Disagreeing	Conflict (f ; e)
	Loc_6	P_1	Asserting	f
	Loc_6 ; [Loc_7 ; Loc_8]		Arguing	Inference ([g ; h] ; e)
	Loc_7	P_1	Asserting	g
	Loc_8	P_1	Asserting	h

Table 4.2 summarises the structure of Example 4, in which the mediator deployed a tactic to open the argumentation stage. In the *Opening stage* situation, the first party asserts a proposition; this corresponds to the opening stage in critical discussion, when the argumentative space has not yet been opened by the discussants. The *Opening the argumentative space* situation corresponds with the argumentative and dialogical moves in which speakers agree that they have to argue in order to resolve their conflicts. It starts with Mediator asking a Pure Question. Once the argumentation space has been opened, the argumentation stage begins, which is visible in the Table by the illocutionary forces of the speakers: most notably Arguing and Disagreeing.

4.3.2 Redirection and Option generation (Section 4.2.2)

Given that, in the transcript, the redirection leads to the option generation, these two strategies are here studied in the same section.

Table 4.3: Tactics for the strategy of redirection

Discussion situation	Locution or transition	Participant	Illocutionary connection	Propositional content
Failure to argue (impasse)	Loc_1	P_1	Asserting	a
	Loc_1 ; Loc_2		Restating	Rephrase (b ; a)
	Loc_2	P_1	Asserting	b
	Loc_1 ; Loc_3		Disagreeing	Conflict (c ; a)
	Loc_3	P_2	Ironic Asserting	c
	Loc_1 ; Loc_4		ø	ø
	Loc_4	P_1	Asserting	d
	Loc_4 ; Loc_5		Arguing	Inference (e ; d)
	Loc_5	P_1	Asserting	e
	Loc_1 ; Loc_6		Restating	Rephrase (f ; a)
	Loc_6	P_1	Asserting	f
	Loc_6 ; Loc_7		Restating	Rephrase (g ; f)
	Loc_7	P_1	Asserting	g
Redirection	Loc_8	Mediator	Pure Questioning	h
End of impasse	Loc_8 ; Loc_9		Default Illocuting	Rephrase (i ; h)
Option generation	Loc_9	P_1	Asserting	i
	Loc_9 ; [Loc_{10} ; Loc_{11}]		Arguing	Inference ([j ; k] ; i)
	Loc_{10}	P_1	Asserting	j
	Loc_{11}	P_1	Asserting	k

Table 4.3 highlights four different dialogical situation. First, the *Impasse*: P_1 and P_2 are discussing, and P_2 disagrees with P_1 but does not argue to support this disagreement and P_1's main moves consist in restating his own propositions. Second, the strategy of *Redirection*: the mediator's move consists in asking a Pure Question which has no relation with the prior discussion between P_1 and P_2. Then, the *End of the impasse*: P_1 answers the Pure Question. Finally, the *Option generation*: P_1 argues to support the answer to the Pure Question. We can thus draw the following conclusion: when the parties do not

argue with each other, the mediator redirects the discussion with a Pure Question which has no relation to the prior topic; this Pure Question can also be used to open the option generation.

4.3.3 Negative collateral implications and temporising (Section 4.2.3)

Table 4.4: Impasse (negative collateral implications) and temporising

Discussion situation	Locution or transition	Participant	Illocutionary connection	Propositional content
Impasse: Negative collateral implications	Loc_1	P_1	Asserting	a
	Loc_1 ; Loc_2		Arguing	Inference (b ; a)
	Loc_2	P_1	Asserting	b
	Loc_1 ; Loc_3		Restating	Rephrase (c ; a)
	Loc_3	P_1	Asserting	c
Temporising	Loc_3 ; Loc_4		ø	ø
	Loc_4	Mediator	Assertive Questioning	d

With Table 4.4 we see that P_1 argues (see the 'Arguing' move in the fourth column) but P_2 does not answer i.e. she does not take part in this dialogue. P_1's moves thus represent the *Impasse* since only one party is actually arguing. Then, we see that the mediator uses an Assertive Question (bottom of the fifth column) which is connected to P_1's last move. This represents the strategy of *Temporising*: the fact that there is a link between her question and the previous moves but that this link is *empty* (see the ø in the fourth and fifth columns) shows that she did not redirect the discussion (as was the case in the previous example) but that she shifted the discussion to another topic. In this particular case, we cannot claim from Table 4.4 alone that the source of impasse presented in this table *is* negative collateral implications: a pragmatic, linguistic and semantical analysis is necessary to see that P_1 is challenging his opponent's character. The fact that P_2 is not taking part in the dialogue at this point however is a strong indicator of impasse in the dialogue.

4.3.4 Unwillingness to be reasonable and temporising (Section 4.2.3)

In Section 4.2.3, the analysis of the impasse of unwillingness to be reasonable was presented in 2 different Figures, however the modelling of the dialogical and argumentative dynamics is presented in a single table: Table 4.5.

Table 4.5: Unwillingness to be reasonable and temporising

Discussion situation	Locution or transition	Participant	Illocutionary connection	Propositional content
Argument	Loc_1	P_1	Asserting	a
	Loc_1 ; Loc_2		Disagreeing	Conflict (b ; a)
	Loc_2	P_2	Asserting	b
	Loc_2 ; Loc_3		Arguing	Inference (c ; b)
	Loc_3	P_2	Asserting	c
Impasse: Unwillingness to be reasonable	Loc_3 ; Loc_4		Agreeing	c
	Loc_4	P_1	ø	ø
	Loc_4 ; Loc_5		Arguing	Inference (c ; d)
	Loc_5	P_1	Asserting	d
	Loc_1 ; Loc_6		Restating	Rephrase (e ; a)
	Loc_6	P_1	Asserting	e
	Loc_6 ; Loc_7		Arguing	Inference (f ; e)
	Loc_7	P_1	Asserting	f
Temporising	Loc_7 ; Loc_8		ø	ø
	Loc_8	P_2	Asserting	g
	Loc_8 ; Loc_9		Arguing	Inference (h ; g)
	Loc_9	P_2	Asserting	h
Argument	Loc_9 ; Loc_{10}		Agreeing	h
	Loc_{10}	Mediator	Asserting	i

Table 4.5 shows that P_2 disagrees with P_1 and provides an argument (see Loc_2 ; Loc_3, and the fourth and fifth columns); P_1 agrees with it but then restates his first proposition, that is the one that Viv disagreed on: this is the *Unwillingness to be reasonable*. The transition from Loc_7 to Loc_8 and the two symbols ø associated (last two columns) show that the topic is the same; the Assertion of P_2 (Loc_8) does not serve to argue or disagree or agree with anything said before: this is the strategy of *Temporising*. The Table also shows that the mediator agrees with P_2 (Loc_9 ; Loc_{10}). As we have seen in the previous section, Greatbatch and Dingwall (1997) have shown that parties often manage to detect

and react to impasses on their owns, without the mediators' help. This may explain why the mediator agrees with her: to acknowledge that her reaction was fair and welcome.

4.3.5 Clarification of misunderstandings (Section 4.2.4)

As in the previous example, in Section 4.2.4, the analysis of the clarification of misunderstandings was presented in 3 different Figures, however the modelling of the dialogical and argumentative dynamics are here presented in a single table: Table 4.6.

Table 4.6: Tactics for the clarification of misunderstanding

Discussion situation	Locution or transition	Participant	Illocutionary connection	Propositional content
Past conversation - Misunderstanding	Loc_0	P_1 and P_2	Asserting	z
Detection of misunderstanding	Loc_1	Mediator	Asserting	a
	Loc_1 ; Loc_2		Agreeing	a
	Loc_2	P_2	ø	ø
	Loc_1 ; Loc_3		Arguing	Inference (b ; a)
	Loc_3	Mediator	Asserting	b
	Loc_3 ; Loc_4		Arguing	Inference (b ; c)
	Loc_4	Mediator	Asserting	c
Clarification of misunderstanding	Loc_5	Mediator	Asserting	Loc_0
	Loc_4 ; Loc_6		Restating	Rephrase (d ; c)
	Loc_5 ; Loc_6		Arguing	Inference (z ; d)
	Loc_6	Mediator	Asserting	d
	Loc_6 ; Loc_7		Assertive Questioning	d
	Loc_7	Mediator	ø	ø
	Loc_7 ; Loc_8		Agreeing	d
	Loc_8	P_2	ø	ø
	Loc_8 ; Loc_9		Arguing	Inference (e ; d)
	Loc_9	P_2	Asserting	e
	Loc_7 ; Loc_{10}		Agreeing	d
	Loc_{10}	P_1	Asserting	f

Table 4.6 shows the tactics for *clarification of misunderstandings* (see Section 4.2.4). In this passage, the mediator reports the parties' speech at Loc_5 ("You've both mentioned the idea that you're not going to be here forever"). To capture nested locutions (i.e. re-

ported speech), we introduce a Loc_0 referring to the reported locution. Therefore, Loc_5 has Loc_0 as propositional content. Reporting the parties' claims in this situation is not surprising given that the goal here is to show them that they may have the same opinion even though they expressed it in different ways. Then, the mediator uses an Assertion and an Assertive Question with the same propositional content d right after the reported speech. We can therefore see that, when the mediator wants to clarify misunderstandings, she first reports the parties' speech and then seeks their agreement via an Assertive Question. In this excerpt both parties agree with d: it means that they are acknowledging the misunderstanding. Therefore, the mediator's tactic has been efficient: she has clarified the parties' misunderstanding.

4.3.6 Suggesting arguments (Section 4.2.5)

The strategy of suggesting arguments has been analysed in three figures. Table 4.7 is a summary of the whole Example 9.

Table 4.7: Tactics for suggesting arguments

Discussion situation	Locution or transition	Participant	Illocutionary connection	Propositional content
Mediator's summary of discussion	Loc_1	Mediator	Asserting	a
	Loc_1 ; [Loc_2 ; Loc_3 ; Loc_4]		Arguing	Inference ([b ; c ; d] ; a)
	Loc_2	Mediator	Asserting	b
	Loc_3	Mediator	Asserting	c
	Loc_4	Mediator	Asserting	d
	Loc_4 ; Loc_5		Agreeing	d
	Loc_5	P_1	ø	ø
	Loc_4 ; Loc_6		Arguing	Inference (d ; e)
	Loc_6	Mediator	Asserting	e
	Loc_6 ; Loc_7		Arguing	Inference (f ; e)
	Loc_7	P_1	Asserting	f
	Loc_7 ; Loc_8		Restating	Rephrase (g ; f)
Suggesting argument	Loc_1 ; Loc_9		Arguing	Inference (a ; h)
	Loc_9	Mediator	Asserting	h
	Loc_9 ; Loc_{10}		Assertive Questioning	h
	Loc_{10}	Mediator	ø	ø
	Loc_{10} ; Loc_{11}		Agreeing	h
	Loc_{11}	P_2	ø	ø

Table 4.7 summarises the strategy depicted by Figures 4.13 to 4.15 in Section 4.2.5. We clearly see what the mediator's tactic is: he first summarises the discussion (this is visible only through a linguistic and semantic analysis). The different arguments which he builds therefore concern a topic of the discussion, rather than the dispute itself; as a consequence, he does not put his neutrality at stake. He then puts the strategy of suggesting arguments into place: he uses a locution from his summary to build an argument, and then asks the parties if they agree. This question therefore also concerns the topic of the discussion. Given that P_2 agrees, his strategy has worked: the suggested topic to tackle is acknowledged by the disputant. The discussion will then undoubtedly be about what he only suggested.

4.4 Summary

In Section 4.1, we have seen that the growing public interest in mediation has led to an increasing number of publications from different domains focusing on discourse in this context. Having reliable data to study is crucial to develop research further. Although there is a lack of real transcripts (i.e. there is a large preponderance of role-plays), resources for mediation can be obtained in several ways, e.g. using previous research, looking for scripts online, discussing with practitioners, etc. A repository of mediation transcripts is therefore valuable for the research community to share and (re)use data for mediation discourse. For this reason, the publicly available Dispute Mediation Corpus has been created. It currently comprises 293 extracts from different sources (mock and real mediation transcripts, excerpts taken from academic publications, etc.). Although the corpus is composed of argument analyses, the original texts (i.e. raw texts) are stored in a database, therefore, its use is not limited to research in argumentation and can as well support research in other domains (e.g. sociology, linguistics, communication etc.), which will lead to a better understanding of the growing activity of mediation, and discourse in general.

The DMC is the resource used throughout the following Section (Section 4.2); and the remainder of the present work: the various corpus analyses are stored in the DMC, which promises to save the findings, as well as allow the reader to go through the analyses online, for a better legibility of the figures which are presented. Extending and sharing this resource will facilitate access to mediation transcripts, and therefore allow more studies to be carried out. Several domains of research can take advantage of such a corpus. Computational linguistics and machine learning techniques in particular represent areas which can process this corpus to support research or to implement a tool; argumentation theorists may find in it a resource for the study of arguments in dialogical contexts; some research in pragmatics could also use it for the various linguistic contexts it contains. These are only a few examples of possible uses, but it makes no doubt that research in natural language and conflict resolution in a broad sense will benefit from an expanded sharing of the DMC.

After introducing the DMC, we have seen that fine-grained analyses of the argumen-

tative structure of mediation dialogues are required to highlight how and why the discussions in dispute mediation progresses. The close analyses carried out differ from the types of analyses done until now by e.g. Aakhus or Greco Morasso. They explain the discourse characteristics of mediation but also permit deriving the argumentative structure from them. For example it has been shown how and why mediators redirect the discussion (Section 4.2). The tables in Section 4.3 are useful to understand which sequence of moves corresponds with a particular strategy (presented in Section 4.2). Given that this approach allows us to connect for the first time high level descriptions of mediators' strategies (such as those explored in (Greco Morasso, 2011; Aakhus, 2003)) with the detailed tactical manoeuvring which they carry out, this type of analysis can be extended to most of the mediation discourse in order to come up with a clear image of the argumentative process. (Janier et al., 2015) for example proposes such a methodology for the modelling of mediation activity in the case of impasses.

The development of technologies arising from research in argumentation gives the possibility to offer tools for mediators in order to make their job easier and more effective. For this, as we will see in the following chapter, the Tables in Section 4.3 are valuable, as they represent the opportunity for modelling mediation discourse features which had been described in works of research in the domain.

This chapter eventually is the first step towards the creation of a tool for mediation practice. Chapters 5 and 6 below are the logical continuation of these findings: we will see how the argument analyses presented throughout the present chapter allow implementing a dialogue game which, once executed, allows players to engage in a mediation dialogue.

Chapter 5

Modelling and specification of a dialogue game for mediation

Despite an increasing popularity, mediation has not much benefitted from computational advances which could make the process easier and more effective. Technological tools can however provide an aid and support mediators' job. The few works of research which have tried to implement such tools have been introduced in Chapter 2 and include (Tanaka et al., 2007), (Bellucci and Zeleznikow, 2005) or (Gordon and Karacapilidis, 1997). Although such projects have brought valuable insights as to what can be done to support mediators (see in particular (Gordon and Märker, 2002)), none has effectively accounted for dialogical and argumentative dynamics to allow replicating conversations in mediation. Patterns discovered during corpus analyses as reported in Chapter 4, however provide valuable information which, once modelled and formalised, can be implemented in systems supporting mediation dialogical activity.

5.1 Motivation

As we have seen in Chapter 1, a major part of mediators' training is to take part in role-plays, in which mediators-to-be exercises their skills with experienced mediators on credible case scenarios. This allows them to improve their capabilities and to get feedback from their trainers. But, an add-on to this training would be to enable them to practice their skills without human supervision. A possible way of doing this, would be to de-

velop a system which would replicate what role-plays provide i.e. scenarios of probable disputes and people playing the role of conflicting parties in which the training mediator could put into practice her third-neutral techniques. Computational tools make it possible through the development of multi-agent systems i.e. software modelling natural communication and allowing interactions between virtual and or human agents. Moreover, computational systems represent cost-effective and time-effective tools for training (for instance, there is no need to pay a human supervisor, and students do not depend on their supervisors and can have access to the system at any time). Furthermore, such a system can be easily improved to suit the needs of users and can be developed as software or as online platforms, giving the possibility to be used by a large number of mediators.

To develop such a tool, knowledge provided by the literature (presented in Chapter 2) and insights from what fine-grained analyses in Chapter 4 have revealed can help define the main mediation discourse dynamics. It is then possible to describe mediation discussions in the form of a dialogue game. Here lays the challenge tackled in the present chapter, where a minimal dialogue game for mediation is presented.

In dialectical systems, dialogical interaction is viewed as a game with rules which players must follow. The rules of a game are explicated in a dialogue protocol which specifies how the discussion can or should unfold. These rules depend on the type of dialogue the participants are involved in (e.g. persuasion, negotiation or inquiry). For example, the rules will be different according to whether participants want to convince each other of the truth of a proposition or whether they want to resolve a mathematical problem. A variety of dialogue games has therefore been proposed to help us understand, improve or replicate argumentative interactions. For instance, Hamblin (1970) defines a game for the conduct of dialogues without fallacies; Walton and Krabbe (1995) provide two dialogue games for the persuasion type of dialogue, and Gordon (1993a) proposes a formal game for civil pleadings. McBurney and Parsons (2002) have shown that actual conversations, however, are a mixture of several dialogue types and they can even be embedded (that is, when one dialogue type is wholly contained in another dialogue type). As a consequence, combining different types of games has thus allowed the development of more complex systems such as (Kacprzak and Yaskorska, 2014).

In most dialectical systems, a dialogue game consists of:

- commencement rules: the rules defining how a dialogue should start
- locution rules: the rules defining which types of utterances are permitted
- structural or combination rules: the rules defining which types of utterances are permitted at particular moments
- commitment rules: the rules defining how participants can express their commitment to a particular statement
- termination rules: the rules defining when a dialogue ends

Despite a large number of dialectical systems in the literature (see (McBurney and Parsons, 2003) for an overview), none has, to my knowledge, ever been specifically developed for dispute mediation. This is the challenge taken up here, with a two-fold motivation: first, formalising mediation discourse promises a theoretical framework and a normative view of argumentative interactions; second, executing the game offers the opportunity to deliver a practical tool to support mediation, a conflict resolution process which has enjoyed little computational attention.

Empirical studies provided by the literature on mediation discourse (see Chapter 2 and 4), as well as insights from dialectical systems conventions and statistical data coming from IAT fine-grained analyses (see Chapter 4) are the basis for the methodology adopted here. If we consider that a typical mediation is a discussion in which parties must argue for or against a proposition and the mediator redirects the discussion or restates the disputants' standpoints whenever agreement cannot be quickly reached, then we can take advantage of a general framework where the dialogue can be easily modelled and formalised to define a mediation dialogue game. This novel approach assembles eventually the existing knowledge on mediation discourse and dialogue games with the recent findings presented in the previous chapter.

5.2 Specifying a Mediation Dialogue Game: MDG

In this section, the rules of a generic mediation dialogue game (MDG) are specified. Developing such a dialogue game is empirically and normatively grounded: knowledge of mediation discourse, provided by empirical studies such as (Jacobs and Aakhus, 2002b; Greco Morasso, 2011) gives the opportunity to define general rules such as what are the player's argumentative roles or how a standard mediation unfolds, and corpus studies, mainly reported in Chapter 4, support in particular the formulation of locution rules (Section 5.2.2).

The rules of MDG capture the minimal characteristics of mediation dialogues. Keeping in mind that this game can be executed and used for mediation training, the rules provide strategic moves to the mediator such as tackling new issues (see e.g. rule SR9.2 in Section 5.2.4 below). Moreover, the game offers a normative framework guaranteed by rules that assure parties' reasonableness: they cannot have inconsistent commitments and are forced to answer questions and challenges (see e.g. rule SR7 below). The set of rules for MDG is presented below.

5.2.1 Players, domain and general considerations

Players MDG captures the opening and argumentative stages of a dispute which involves three players: P_1 and P_2, who play the role of disputing participants (or parties), and M who plays the role of the mediator. The notations P_x and P_y are also used, in which $x, y \in \{1, 2\}$ and $x \neq y$, when the rules hold for any of the party but a distinction is nevertheless needed.

Domain In MDG, P_1, P_2 and M engage in a dialogue to resolve a dispute on topic t by advancing a set of propositions p, q, and so on, which belong to the domain t (e.g. divorce, child custody). t can be any topic tackled in civil case mediations (e.g. child custody or workplace dispute), and propositions p, q etc. are any proposition about the dispute at stake.

5.2.2 Locution rules

Locution rules define the types of moves which players can perform during the game. They are composed of two elements: the proposition (or propositional content) symbolised by lower-case letters (e.g. p) and its illocutionary force, forming a function of the type Illoc-Force(p). Following Searle's and Austin's definition of illocutionary forces (Searle and Vanderveken, 1985; Austin, 1975), in the dialogue game, Illoc-Force(p) captures an illocutionary act, i.e. the speaker's position towards a propositional content p (whether he is asserting, questioning or disagreeing on p, for example); the function does not intend to capture the perlocutionary act or perlocutionary effect.

In Chapter 4, corpus analyses have shown a set of illocutionary forces characterising mediation participants' moves, and statistical analyses motivate the selection of the illocutionary forces needed in MDG. The illocutionary forces used in MDG are given below, along with their occurrences in the DMC and their definition, because their use and meaning in the system slightly differ from what was reported in Chapter 3.

Asserting, A (50.6%): is used when a speaker states an opinion or relays an event, e.g. "I should have full custody."

Pure Questioning, PQ (4.1%): is used when a speaker wants to know about the hearer's opinion, e.g. "Do you think that you should have full custody?", allowing for discovering some fact or an interlocutor's opinion.

Assertive Questioning, AQ (3.3%): is used when a speaker wants to know if the hearer shares her or someone else's point of view, e.g. "Do you agree that your daughter should see her father several days a week?"

Pure Challenging, PCh (0.5%): is used when a speaker is looking for the hearer's grounds for stating a particular opinion, e.g. "Why do you think that he should not be allowed to see your daughter?"

Restating, R (6.3%): is used when a speaker asserts a proposition which has already been introduced (not necessarily uttered), but changes its linguistic surface, e.g. if a discussant previously uttered "I'll take the kids home 3 days a week", another

speaker can later restate this proposition by saying "He'll have the children all week-ends".

Withdrawing, W : is used when a speaker retracts a proposition previously stated, i.e. does not believe that p is the case anymore.

Agreeing, Agr (5.5%): is used when a speaker positively responds to an AQ, e.g. "Sure.".

Disagreeing, Disagr (3.6%): is used when a speaker negatively responds to an AQ, e.g. "Definitely not.".

Arguing, Arg (15.9%): is used when a speaker constructs an argument i.e. provides support (premises) for a claim (conclusion)[1].

Having defined these illocutionary forces, and knowing the typical behaviours of mediation participants (see Chapters 2 and 4), it is now possible to specify the locution rules (LR) for MDG in Table 5.1.

Table 5.1: Locution rules

LR1	M can only question (Q), challenge (Ch) or restate (R): 1. PQ(p) when he asks whether p is the case, i.e. if P_x is committed to p 2. AQ(p) when he seeks P_x's agreement on p 3. PCh(p) when he seeks P_x's ground for stating p 4. R(p) when he reuses P_x's proposition p
LR2	P_x cannot question or challenge but will respond to Qs and Chs in one of the following ways: 1. A(p) when he states an opinion 2. W(p) when he retracts p 3. Agr(p) when he agrees on p 4. Disagr(p) when he disagrees on p

IAT analyses in Chapter 4 and the literature on the topic (Chapters 2 and 4) have shown that mediators' main moves consist in questioning disputants (e.g. to ask for their points of view on what the possible solutions to resolve the dispute are) and restating propositions (e.g. to summarise the parties' positions) for argumentative strategic reasons (cf. the advocacy strategies in (Jacobs, 2002)) . Questioning (Q) and Restating (R) must therefore be available in the dialogue game's rules: this is provided by LR1. As we

[1] Argumentation schemes are not considered in the IAT analyses presented in this work. As a consequence, in the game, Arguing is used to show that a speaker has provided two propositions, one supporting the other. Fallacious arguments can therefore occur and are not forbidden.

have seen in Chapter 4, disputants use illocutionary forces other than Asserting, however, in MDG, P_1 and P_2's moves are constrained by forbidding them to question, challenge or restate. If this game is indeed intended to mediators for practicing their techniques, M should be the only one to have 'strategic' moves available: PQs (Pure Questions) to launch the discussion and new issues to broach (LR1.1), AQs (Assertive Questions) to seek other players (dis-)agreement (LR1.2), PChs (Pure Challenges) to foster argumentation (LR1.3) and, most importantly, R (restate) to be able to go back to a previous proposition (LR1.4)[2]; furthermore, M cannot assert (A) propositions to comply with the mediator's principle of neutrality.

On the other hand, P_1 and P_2 can make Assertions (A) which allow them to give their opinion (LR2.1). With LR2.2 parties can withdraw (W) a proposition. Note that Withdrawing is not an illocutionary connection which has been found in the DMC; however it is a common and useful illocutionary force in dialogue games (see e.g. (Walton, 1984; McBurney et al., 2003; Prakken, 2005)) since it is a move which allows players to retract a proposition and to revise their commitments. This feature allows updating commitments and its usefulness is elicited by structural rules (see Sections 5.2.3 and 5.2.4). Finally, P_x can Agr (agree) and Disagr (disagree) to show his position regarding claims which he did not introduce (LR2.3 and LR2.4). Note that the definition of Agr is close to the *concede* move in other dialogue games (cf. (Prakken, 2006)).

It is important to note that we do not specify a locution rule to permit players to *argue*. As stated in (van Eemeren and Grootendorst, 1982) and (Budzynska et al., 2014a), 'arguing' is a complex illocutionary force which takes shape only by virtue of the interrelation between locutions: one can build an argument by asserting p and q and showing that there is an inference between p and q, e.g. "p because q". Hence, *arguing* is automatically created when support for a proposition is given and, in MDG, PCh allows for triggering inference[3].

Moreover, it has been shown that in some discursive contexts, AQ is more frequent

[2]According to IAT's definitions, Assertive Questions are used to trigger the interlocutor's (dis-)agreement while Pure Challenges are used to trigger an interlocutor's claim which will support (provide grounds for) a prior claim. In the game, M can use both illocutionary forces according to which of both reaction he wants to trigger. These are instrumental definitions: assertive-questioning and pure-challenging are M's assumed intentions when he advances these moves.

[3]As we will see in Section 5.3, inferences are automatically created in MDG thanks to the AIF ontology

than challenges to trigger argumentation (e.g. in debates (see (Yaskorska and Janier, 2015) and Chapter 3), or in financial dialogues (Budzynska et al., 2014c)). Pure Challenging indeed has a low frequency in the DMC; as we have seen in Chapter 3, this is explained by the fact that speakers do not necessarily wait to be challenged to support their opinion. However, formal dialectical systems' standards are followed here by including challenges which are, in the game, the only way for players to construct inference between propositions because parties cannot advance two propositions in a single turn (see Section 5.2.4).

5.2.3 Commitment rules

Integrating commitment-stores to a dialogue game is a convenient way to detect when consensus on an issue is reached (Walton and Krabbe, 1995). They allow keeping track of the propositions which speakers are committed to. Propositions are thus updated according to the developments of the dialogue. In Table 5.2, Com_x symbolises P_x's commitment-store. Note that only P_1 and P_2 have commitment-stores; this is meant to reflect the mediator's neutrality. Updating a store therefore only happens when P_x moves.

Table 5.2: Commitment rules

CR1	After A(p), performed by P_x, p is added to Com_x
CR2	After W(p), performed by P_x, p is removed from Com_x
CR3	After Agr(p), performed by P_x, p is added to Com_x
CR4	After Disagr(p), performed by P_x, $\neg p$ is added to Com_x

Hamblin's view of speakers' commitments (Hamblin, 1971) is followed in our game: a speaker is committed to a statement if he personally utters the statement (CR1) or when he agrees with a statement uttered by an interlocutor (CR3). As in most formal dialogue systems (e.g. DC (Mackenzie, 1979), CB (Walton, 1984), PPD (Walton and Krabbe, 1995)), MDG allows players to retract propositions: if a proposition is withdrawn, it is assumed that the players are no more in conflict about this proposition and consensus is reached on this particular proposition (CR2). Commitment rules in MDG however differ from those in other dialogue games since propositions are added to a commitment store only if they have been asserted or agreed with. In many dialogue games, indeed, a stated proposition is added to all players' stores; if a player is not committed to this proposition,

he has to explicitly withdraw it. In MDG, on the other hand, a proposition is solely added in the store of the player who asserted (or agreed on) it. This is defined in CR1 and CR3. CR4 specifies that if a proposition p is disagreed with, then the opposite proposition ($\neg p$) is added to a store (see also (Wells and Reed, 2012)). This rule allows M to deploy a strategy: when $\neg p$ is added to a player's commitment store after he disagreed with p, M is able to ask him whether his disagreement with p means that he is committed to $\neg p$. This is to ensure the relevance and consistency of dialogues: a player cannot simply disagree on p; he has to agree with $\neg p$, provide reasons for $\neg p$ or withdraw $\neg p$.

5.2.4 Structural rules

Structural rules regulate how the dialogue can proceed i.e. which move is permitted, for which player, after a particular move. These are presented in Table 5.3.

Table 5.3: Structural rules

SR1	P_1 and P_2 can only perform one move per turn
SR2	M can perform a maximum of two moves per turn iff the first move consists of restating (R)
SR3	The dialogue starts with M seeking P_1 and P_2's respective points of view regarding *t*,therefore: 1. M moves first with PQ(*t*) addressed to P_1 2. After that, P_1 must answer with A(*p*) 3. Then, M moves with PQ(*t*) addressed to P_2 4. Next, P_2 must answer with A(*q*)
SR4	The second step of the opening stage is to discover P_1 and P_2's grounds for *p* and *q*, therefore: 1. M performs PCh(*p*) addressed to P_1 2. After that, P_1 must answer with A(*r*) 3. Then, M performs PCh(*q*) addressed to P_2 4. Next, P_2 must answer with A(*s*)
SR5	After P_x performed A(*p*), M can perform: 1. PQ(*p*) addressed at P_y 2. AQ(*p*) addressed at P_y 3. PCh(*p*) adressed at P_x
SR6	After M performed PQ(*p*) addressed at P_x, P_x can perform: 1. A(*p*) 2. A($\neg$ *p*)
SR7	After M performed AQ(*p*) addressed at P_x, P_x can: 1. Agr(*p*) 2. Disagr(*p*)
SR8	After M performed PCh(*p*) to P_x, P_x can: 1. A(*q*) 2. W(*p*)
SR9	After P_x performed W(*p*), M can:, 1. AQ($\neg p$) addressed to P_x 2. PQ(*q*) addressed either to P_x or P_y 3. AQ(*q*) addressed either to P_x or P_y
SR10	After P_x performed Agr(*p*), M can: 1. PQ(*q*) addressed either to P_x or P_y 2. AQ(*q*) addressed either to P_x or P_y
SR11	After P_x performed Disagr(*p*), M can, 1. PQ(*q*) addressed to any player 2. R($\neg p$) addressed to P_x and P_y
SR12	After M performed R($\neg p$), M must either: 1. AQ($\neg p$) addressed to P_x i.e. the player who previously disagreed on *p*, or 2. PCh($\neg p$) addressed to P_x i.e. the player who previously disagreed on *p*

According to the literature (e.g. (Kovach, 2005; Greco Morasso, 2011)) and IAT analyses, the argumentative discussion in mediation starts with the mediator asking disputants the reason why they came to mediation. The beginning of the dialogue in MDG therefore aims at revealing P_1 and P_2's respective standpoints w.r.t. the topic of the dispute, which

is why M must ask both parties about the topic t (SR3). To reflect the argumentative function of the dialogue game, P_1 and P_2 must argue but, given constraint SR1 and LR2, argumentation can only be performed by M advancing PCh and P_1 and P_2 answering the challenge, specified in SR4.

SR5 specifies that M can ask a player whether she also believes p, agrees on p; M can also ask the player whose commitment-store contains p to provide grounds for stating such a proposition. SR5.1 can be considered as the strategy of redirection in the case of impasses (that is, when mediators ask a question which has no relation with what was said before) or as the moment when the mediator leads the way towards the different options (see Chapter 4 and 4.3 in particular). SR5.2 allows M to verify whether parties agree on some proposition to clarify misunderstandings (see 4.6); with SR5.3 the argumentative character of mediation discussions is respected.

SR6 specifies that P_1 and P_2 must make their positions clear on a proposition p when M asks a PQ: they are either committed to p (SR6.1) or not (SR6.2). After an AQ, which looks for consensus, a player can agree or disagree on p (SR7).

SR8 allows a player to argue for a standpoint (SR8.1) or to retract a proposition (SR8.2): again, this is meant to reflect the argumentative aspect of mediation dialogues as well as ensure consistency and reasonableness: either a speaker argues for her positions or she retracts the proposition if she is unable to provide an argument.

If a player withdraws a proposition p, M can ask whether the player is then committed to $\neg p$ (SR9.1)[4] or, he can explore new issues by asking questions on other propositions (SR9.2 and SR9.3). SR9.1 allows ensuring consistency: if a speaker retracts a proposition he previously uttered, the mediator can check if he is then committed to the opposite proposition. SR9.2 is again a means for M to redirect the discussion, while SR9.3 allows the mediator to suggest arguments (see Table 4.7). M can also explore other propositions with SR10: SR10.1 to redirect the discussion with a Pure Question, and SR10.2 to suggest arguments with an Assertive Question.

[4]We have seen that commitment stores are a mechanism to ensure consistency: if P_x withdraws p, $\neg p$ is added to his commitment store. To make sure that P_x is definitely committed to $\neg p$, he has to explicitly state it. This is possible with rule SR9.1: M will ask P_x if he has withdrawn p because he is committed to $\neg p$. If P_x agrees, then $\neg p$ stays in his commitment store; otherwise, $\neg p$ is removed and replaced by p. M will then have different strategies: either he will redirect the discussion (SR11.1) or he will restate $\neg p$ in order to find out the proposition to which P_x is actually committed (SR11.2).

If a player disagrees with a proposition p, M can redirect the discussion to another issue (SR11.1), or check whether the player is then committed to $\neg p$ by restating $\neg p$ (SR11.2). R($\neg p$) automatically works with SR12: first M restates the party's commitment. Note that at that point the party has not uttered $\neg p$; however, since he has disagreed on p, his commitment store has been updated to include the opposite proposition $\neg p$ (see commitment rules in Table 5.2). When M restates $\neg p$ it is meant to emphasise that if the player has disagreed with a proposition, he has to be committed to the opposite proposition $\neg p$, but to make sure that it is actually the case, M must then ask him if he agrees with $\neg p$ (SR12.1) or ask him to provide grounds for this commitment (SR12.2). Rules SR 11.2, 12.1 and 12.2 ensures that the discussion is reasonable (by preventing players from having incompatible commitments). With the last three rules the importance of the technique of restating is put into relief: we have seen that when a player disagrees with a proposition p, the opposite proposition is added to its commitment store (rule CR4). This proposition $\neg p$, however, has never been asserted by the player, and M may want to make sure that the player actually believes $\neg p$. There are two possibilities for this: either seek for (dis-)agreement on $\neg p$ via an AQ, or challenging $\neg p$, in which case the player will give a support for $\neg p$ or withdraw it. These rules therefore allow M to clarify the players' standpoints: if they disagree on a proposition p, it does not necessarily mean that they believe the opposite, and this must be made clear in the game so that all positions are explicitly provided.

Please note that one rule which used to appear in the conference paper from which this Chapter is drawn has been removed (cf. (Janier et al., 2016)). In the original version, rule SR7.1 stipulated that after AQ(p), P_x could perform W(p); yet, AQ(p) in MDG is used to verify whether both parties agree on p, and is therefore asked to the party who did not assert p. As a consequence, a party cannot withdraw p after AQ(p) since he never asserted p and, therefore, is not committed to p[5]. The remaining of this chapter, as well as next chapter, which is based on the definition of MDG rules, take into account this change in the numbering and definition of the rules (that is, SR7.1 as defined in the original version

[5]Remember that in the game, Assertive Questions are asked to the party who did not assert p in order to check whether both parties agree on p. We have seen in Section 5.2.3 that if a party did not assert p, p is not added into his commitment store; therefore he cannot withdraw something he did not utter. This is why M has to assertive-question this party about p: to check whether he is committed to p too, or whether he is not.

of the conference paper is not considered anymore).

5.2.5 Termination and outcome rules

Termination rules define how and when the dialogue must end. In mediation, the process ends when a final agreement between disputants has been reached or when, after a certain time, disputants and mediators reckon that no agreement is possible. In MDG, the dialogue can terminate at any point, provided that the last player to move is not M i.e. when M's questions or challenges have been responded to.

Outcome rules should specify, at the end of a dialogue, who wins and who loses. A mediation is, by essence, not a win/lose process: if mediation is successful, disputants leave the session with an accord which equally satisfies them. Moreover, the game is designed to capture the opening and argumentation stages of a dialogue, and does not include the concluding stage (i.e.the stage in which participants determine if the conflict of opinion has been resolved van Eemeren and Houtlosser (2003)). The outcome is therefore not taken into account, that is why outcome rules are not specified either.

5.3 Formal specification in DGDL

MDG relies on the AIF+ core ontology (Reed et al., 2008b) for the definition of its protocol, as has been previously done by Visser et al. (2011). This study was indeed a first attempt towards modelling the pragma-dialectical ideal model of critical discussion (see Section 2.3.3), with the view to implement a dialectical system. The authors demonstrate that the strong emphasis of the pragma-dialectical view of the critical discussion on pragmatic and linguistic aspects of argumentation is successfully handled with the AIF+ format. Indeed the high level of detail of the AIF widely captures the characteristics of a critical discussion, which was hardly possible with other formats. MDG somewhat follows this line of work by proposing a modelling of mediation dialogues with the language and standards of AIF.

Following AIF's recommendations (see 2.5.1), Wells and Reed (2012) have proposed a Domain Specific Language (DSL) to formulate and specify any dialectical game in a

unified format in order to ensure their interchange between the plethora of online argumentation tools: the Dialogue Game Description Language (DGDL). Their aim was to reconcile the variety of formats and languages used by dialogue game developers, experts and users. The main four reasons given by the authors for the development of DGDL are the following: (i) to unify the format of expression of the variety of already existing games and make this format machine-readable for implementation, (ii) to propose a simple language for the development of new games, (iii) to support the sharing of protocols between different argumentation tools, and (iv) to enable the comparison and evaluation of different games. By translating already existing games into DGDL (such as Hamblin's (Hamblin, 1970), Mackenzie's DC (Mackenzie, 1981) or Walton and Krabbe's PPD and RPD (Walton and Krabbe, 1995)), Wells and Reed have demonstrated that DGDL is a concise and powerful enough language to be applied to most of existing dialogue games; they also developed a new game BG (the Bargaining game), in which shifting between a persuasion dialogue and a negotiation dialogue is made available to players. The authors first analysed several dialectical games to reveal their features and then proposed the DGDL as a unified framework for their expression. DGDL hence handles:

- Turn-taking: turns specify which player can make a move at any point of the dialogue; they may consist of a single move, a defined number of moves or an arbitrary number of moves, decided by the player. Strict ordering of turns means that after a turn, another player must move; a liberal ordering of turns means that the next player to move is decided according to the previous move (e.g. in TDG, a player can move several times in a single turn, unless one of their moves mandates a response from the listener (Bench-Capon, 1998)).

- Players: participants of a game. They must have an identifier and a role (e.g. speaker and listener, proponent and opponent or initiator and respondent, etc.) assigned.

- Commitment-stores (as defined in Hamblin's research works (Hamblin, 1970) and as adopted by most of the other dialectical game developers). Stores can be either public or private (e.g. to reflect the dark-side stores in Walton's games (Walton and

Krabbe, 1995)) and be owned by an individual player or shared between some or all the players.

- Interactions: the moves which players can make and which trigger changes in the game (such as the updating of commitment stores or the availability of permissible moves at any point in the dialogue)

- Rules: the triggered effects whenever some pre-defined action has occurred.

DGDL has therefore been chosen to specify MDG because of its expressivity and its ability to handle the large set of rules specified in Section 5.2 as well as its demonstrated applicability for different dialogues specification (Bex et al., 2014). The formal specification of MDG consists in formulating the rules presented in Section 5.2 into DGDL so that the game can be later executed (see Chapter 6); the DGDL specification is presented in Specifications 1 and 2.

Specification 1 Mediation Dialogue Game (part1)

```
1   System{Mediation{
2       turns{magnitude:multiple, ordering:strict}
3       roles{speaker, listener, Mediator, Party}
4       players{min:3, max:3}
5       player{id:Mediator, roles{Mediator}}
6       player{id:PartyOne, roles{Party}}
7       player{id:PartyTwo, roles{Party}}
8
9       store{id:CommitmentsPartyOne, owner:PartyOne, structure:set, visibility:public, {""}}
10      store{id:CommitmentsPartyTwo, owner:PartyTwo, structure:set, visibility:public, {""}}
11      backtrack{on}
12
13
14      /* ?? RULES ?? */
15      rule{id:StartingRule, scope:initial,
16              { move(add, next, PureQuestion, PartyOne, {p}, Mediator)
17              }
18      }
19
20
21      /* ?? INTERACTIONS ?? */
22      interaction{PureQuestion, $Participant, {p}, PureQuestioning, {p}, "Do you believe $p?",
23              { move(add, next, Assert, {p}, Target)
24              & move(add, next, Assert, {!p}, Target)
25              }
26      }
27
28      interaction{AssertiveQuestion, $Participant, {p}, AssertiveQuestioning, {p}, "Do you agree $p?",
29              { move(add, next, Agree, {p}, Target)
30              & move(add, next, Disagree, {p}, Target)
31              }
32      }
33
34      interaction{PureChallenge, $Participant, {p}, PureChallenging, {p}, "Why $p?",
35              { move(add, next, Assert, {q}, Target)
36              & move(add, next, Withdraw, {p}, Target)
37              }
38      }
39
40      interaction{Assert, {p}, Asserting, {p}, "I assert $p",
41              {
42              if{ player(PartyOne) } then
43                      { store (add, {p}, CommitmentsPartyOne , PartyOne)
44                      & move(add, next, PureQuestion, PartyTwo, {p}, Mediator)
45                      & move(add, next, AssertiveQuestion, PartyTwo, {p}, Mediator)
46                      & move(add, next, PureChallenge, PartyOne, {p}, Mediator)
47                      }
48              else
49                      { store (add, {p}, CommitmentsPartyTwo, PartyTwo)
50                      & move(add, next, PureQuestion, PartyOne, {p}, Mediator)
51                      & move(add, next, AssertiveQuestion, PartyOne, {p}, Mediator)
52                      & move(add, next, PureChallenge, PartyTwo, {p}, Mediator)
53                      & assign(Mediator, speaker)
54                      }
55              }
56      }
```

In our DGDL Specification 1, line 1 explains that the system described is the Mediation Dialogue Game, in which there is not a predefined number of turns (line 2). Note that on line 3, "speaker" and "listener" are constants in DGDL used to define roles whereas "Mediator" and "Party" are the roles specific to MDG. Lines 4-10 specify the number of players, their roles and identifications (see Section 5.2.1), and their commitment stores (see Section 5.2.3). On line 11, the backtracking ensures the flexibility of the specification: it allows users to go back to a previous move. For instance, if P_x has asserted p at some point, M can question p later on (even after several moves have been made in between). Lines 15-18 explain how the dialogue must start (rule SR3.1). The *INTERACTIONS* (line 22 onwards) are the moves which each participant in the dialogue can make, along with the associated effects on commitment stores. Lines 22-26 correspond with SR6. Lines 28-32 and 34-38 respectively correspond to SR7 and SR8. Lines 40-56

specify rules SR5 and CR1 together and the obligation for M to move next.

Specification 2 Mediation Dialogue Game (part 2)

```
1     interaction{Withdraw, {p}, Asserting, {p}, "Withdraw $p",
2               {
3               if{ player(PartyOne) } then
4                       { store (remove, {p}, CommitmentsPartyOne , PartyOne)
5                       & move(add, next, AssertiveQuestion, PartyOne, {!p}, Mediator)
6                       & move(add, next, PureQuestion, $Party, {p}, Mediator)
7                       & move(add, next, AssertiveQuestion, $Party, {q}, Mediator)
8                       }
9               else
10                      { store (remove, {p}, CommitmentsPartyTwo, PartyTwo)
11                      & move(add, next, AssertiveQuestion, PartyTwo, {!p}, Mediator)
12                      & move(add, next, PureQuestion, $Party, {q}, Mediator)
13                      & move(add, next, AssertiveQuestion, $Party, {q}, Mediator)
14                      }
15              }
16      }
17
18
19
20      interaction{Agree, {p}, Asserting, {p}, "I agree with $p",
21              {
22              if{ player(PartyOne) } then
23                      { store (add, {p}, CommitmentsPartyOne, PartyOne)
24                      & move(add, next, PureQuestion, $Party, {q}, Mediator)
25                      & move(add, next, AssertiveQuestion, $Party, {q}, Mediator)
26                      }
27              else
28                      { store (add, {p}, CommitmentsPartyTwo, PartyTwo)
29                      & move(add, next, PureQuestion, $Party, {q}, Mediator)
30                      & move(add, next, AssertiveQuestion, $Party, {q}, Mediator)
31                      }
32              }
33      }
34
35      interaction{Disagree, {p}, Asserting, {!p}, Disagreeing, {<{!p},{p}>, DefaultConflict}, "I disagree with $p",
36
37              {
38              if{ player(PartyOne) } then
39                      { store (add, {!p}, CommitmentsPartyOne, PartyOne)
40                      & move(add, next, PureQuestion, $Party, {p}, Mediator)
41                      & move(add, next, Restate, {!p}, Mediator)
42                      }
43              else
44                      { store (add, {!p}, CommitmentsPartyTwo , PartyTwo)
45                      & move(add, next, PureQuestion, $Party, {p}, Mediator)
46                      & move(add, next, Restate, {!p}, Mediator)
47                      }
48              }
49      }
50
51      interaction{Restate, {p}, Restating, {p}, "$p",
52              { move(add, next, AssertiveQuestion, $Party, {p}, Mediator)
53              & move(add, next, PureChallenge, $Party, {p}, Mediator)
54              }
55      }
56      }
57
58
59}}
```

In the following of the formal specification (Specification 2), lines 1-16 correspond with rules SR9 and CR2. Lines 20-33 and 35-49 respectively specify SR10 and CR3, and SR11 and CR4. Finally SR12 is given in lines 51-59.

5.4 Related work

Prakken (2008) is one of the few researchers who have developed a formal system involving three players. He introduces an 'adjudicator' to persuasion dialogue systems to reflect the role of participants in legal settings. MDG is similar to Prakken's model considering that it proposes a specification for three players, including the mediator (M) whose

role is somewhat similar to Prakken's adjudicator in the argumentation phase. Similarly to Prakken's system, our game allows a fair and efficient resolution of the conflict. Structural rules are designed to encourage fairness thanks to a balance between P_1 and P_2's contributions (e.g. the first PQ and PCh are asked alternately to both players) and efficiency is facilitated by assertive-questioning which permits M to seek agreement on several points. Gordon (1993b) also proposes a dialogue game for the legal domain. This game models dialogues during pleadings in which players identify the various issues (procedural and factual) of a case. Contrary to MDG, rules are stipulated which determine how and when the game ends, and who is the winner.

A strength of our dialogue game is that it covers different types of dialogues, while many of the games so far developed concentrate on one type of dialogue e.g. persuasion in (Walton and Krabbe, 1995) and (Prakken, 2006), inquiry in (Black and Hunter, 2009), etc. In MDG, some of M's moves can be compared with information-seeking: when M challenges, he wants the other players to provide more information; this creates arguments and through AQ, M seeks agreement, which is the aim of persuasion dialogue. Finally, the mediation dialogue game as a whole can be seen as a deliberation dialogue since P_1 and P_2's goal is to decide on an action which suits them both, e.g. in case of divorce, sell the house but share the furniture.

A significant difference between MDG and the state of the art lies in the way it handles argumentation. In the Pleadings Game, a theorem prover allows checking whether the players' arguments are indeed arguments. In MDG, no mechanism allows verifying whether the assertion uttered by a player after having been challenged is consistent with the challenged assertion: that is, fallacious arguments can occur and cannot be prevented. In (Prakken, 2006) and (Prakken, 2008) players argue via locutions of the type ϕ *since S* or *argue A*. In the system presented here, argumentation is implicit and is the result of the interactions rather than an action per se. This more closely matches evidence from empirical studies which show that arguments are created by dialogical interactions (Budzynska et al., 2014a). This does not mean that arguments are less important: indeed they are the final result of the interrelation between the different locutions (as specified by rules SR4 and SR8).

In (Gordon and Karacapilidis, 1997) and (Karacapilidis and Gordon, 1995), Karacapilidis and Gordon have developed a system conceptually close to a dialogue game for mediation: the Zeno Argumentation Framework (see also 2.5.5). Composed of four different layers comparable with the set of rules in dialogue games, their system supports argumentation and negotiation of ideas. Human mediators can recommend solutions to participants but cannot take a final decision, which is left to users. Similarly to MDG, their system provides support for argumentation in situations in which practical decisions have to be made but in which conflicting points of view are common and require the intervention of an advisor, or guide. While in Zeno mediators can recommend solutions, MDG is designed to support argumentation and replicate mediation dialogues rather than give advice and recommendations. MDG and Zeno however aim at the same goal: supporting rational, fair and effective decision-making in situations in which conflictual claims and arguments are at the same time common and a point of departure.

5.5 Towards other dialogue games for mediation

MDG models a conversation in mediation. In Chapter 2, however, it has been shown that mediation interactions are a complex blend of several types of discussions. Jacobs and Aakhus have evidenced this by identifying and describing three types of dialogues which occur in mediation: critical discussion, bargaining and therapeutic discussion (Jacobs and Aakhus, 2002b). They have shown that these types of discussion are the mediators' initiatives: they lead the dialogues towards any dialogue types according to the identified nature of the conflict. The differences between the three discussions are visible at different levels: the content, the direction and the outcome of the discussions. As an example, in bargaining, mediators tend to discourage arguments and favour the negotiation of parties' claims.

MDG minimal specification offers the opportunity to extend or revise it in order to further ensure its adequacy with real mediation dialogues. A first step in this direction is to account for the dialogical differences which exist between the three types of discussion identified in (Jacobs and Aakhus, 2002b). Revising MDG so that the game supports these types of discussions will provide a complete tool which accounts for different character-

istics of mediation dialogues. Table 5.4 is taken from (Jacobs and Aakhus, 2002b, p 186) and summarises the distinctive features of the three discussions identified by the authors.

Table 5.4: Models of rationality (taken from (Jacobs and Aakhus, 2002b, p 186))

	Critical discussion	**Bargaining**	**Therapeutic discussion**
Source of conflict	Disagreement over facts and public values	Conflict between competing wants and interests	Failures of mutual respect and mutual understanding
Optimal solution	Claim that is most consistent with available facts and values	Proposal that maximises gain and minimises costs to both parties	Definition of the situation that acknowledges and affirms each party's point of view
Principle of resolution	Public justifiability	Mutual acceptability	Sincerity and openness
Process of resolution	Argumentation and refutation	Offers and concessions	Self disclosure, explanations and definitions
Mode of resolution	Agreement	Contract	Reciprocal affirmation

This summary provides some indication concerning the discourse dynamics of each discussion. These argumentative and dialogical dynamics can be related to IAT's annotation schemes. In the following subsections, the pieces of information provided by Table 5.4 are taken individually and compared with IAT schemes.

5.5.1 Critical discussion

Table 5.5: Possible illocutionary forces in critical discussion

Critical discussion		**What IAT may highlight**
Source of conflict	Disagreement over facts and public values	-asserting -popular conceding -disagreeing
Optimal solution	Claim that is most consistent with available facts and values	-asserting -arguing -restating
Principle of resolution	Public justifiability	-arguing -challenging
Process of resolution	Argumentation and refutation	-arguing -disagreeing -Assertive Questioning
Mode of resolution	Agreement	-agreeing

Table 5.5 shows the illocutionary forces which may be attached to the dynamics identified by Jacobs and Aakhus (2002b) for critical discussions. In a critical discussion, the source of conflict is a disagreement over facts and public values, therefore speakers are likely to *disagree* when another speaker has *asserted* a claim or else, that a speaker uses *popular conceding* to partially disagree with their opponent. The optimal solution is a claim which is most consistent with available facts and values: speakers may *assert* such claim and *argue* for it; the mediator may also *restate* a party's claim in order to make it consistent with the presented facts. If the principle of resolution is justifiability, claims are *challenged* and speakers must *argue*. The process of resolution being argumentation and refutation, parties will *argue* and *assertive-question* their interlocutors to trigger agreement, while their opponents may *disagree*. Finally, the mode of resolution is an agreement, therefore the illocutionary force of *agreeing* will probably appear by the end of the dialogue, showing that the conflict is resolved. The set of illocutionary forces thus identified can be used to define locution rules for a critical discussion dialogue game. Yet, as one can see, most of them are the same as the ones used in MDG. As a consequence, the definition of MDG locution rules may mainly correspond to the dynamics of a critical discussion as defined by Jacobs and Aakhus.

5.5.2 Bargaining

Table 5.6: Possible illocutionary forces in bargaining

Bargaining		**What IAT may highlight**
Source of conflict	Conflict between competing wants and interests	-disagreeing
Optimal solution	Proposal that maximises gain and minimises costs to both parties	-offering
Principle of resolution	Mutual acceptability	-accepting -agreeing
Process of resolution	Offers and concessions	-offering -accepting -rejecting
Mode of resolution	Contract	-agreeing

Table 5.6 compares the dynamics of the bargaining type of discussion to illocutionary forces which may be represented with IAT and rely on Speech Act Theory (Searle, 1969). In bargaining, the conflict originates from competing wants and interests: parties have different expectations and *disagree* with each other. If the optimal solution is a proposal which maximises gains and minimises costs to parties, they will need to negotiate *offers*. The principle of resolution being a mutual acceptability, disputants must *agree* or *accept* the offers. During the resolution process, different *offers* will therefore be *rejected* before one is *accepted*, which will lead the participants to an *agreement*.

This time, there is a different set of such illocutionary forces, which are not present in MDG. These illocutionary forces can therefore be used to formulate locution rules for a new dialogue game for mediation. Structural rules for this type of discussion will have to take into account the locution rules hence defined and be different from MDG's. As an example, a rule can be defined forcing a party to either accept or reject the other party's offer.

5.5.3 Therapeutic discussion

Table 5.7: Possible illocutionary forces in therapeutic discussion

Therapeutic discussion		**What IAT may highlight**
Source of conflict	failure of mutual respect and mutual understanding	-disagreeing
Optimal solution	definition of the situation that acknowledges and affirms each party's point of view	-acknowledging -expressing -asserting
Principle of resolution	sincerity and openness	-expressing -explaining
Process of resolution	reciprocal affirmation	- acknowledging -apologising -agreeing
Mode of resolution	self disclosure, explanation and definition	-expressing -explaining -restating

The source of conflict identified in therapeutic discussions is a failure of respect and understanding between disputants: there are high chances that they will *disagree* with each other. The optimal solution would be to acknowledge the interlocutor's point of view, therefore, whenever a party *expresses* or *asserts* something, the opponent should *acknowledge* it. The sincerity and openness will be evidenced by speakers who *express* their feelings and *explain* their points of view. To resolve their conflicts, disputants will need to *acknowledge* or *agree* with their opponent's opinion or *apologise* for their failure of respect and understanding. Finally, self disclosure, explanation and definition may be elicited by illocutionary forces such as *expressing*, *explaining* or *restating*.

In Table 5.7, another set of illocutionary forces is therefore proposed. It represents the possibility of defining another set of locution rules for the therapeutic type of discussion. Again, structural rules for this type of game will have to take into account the new illocutionary forces and their combination. For example, one rule may be defined to constrain players to reformulate (or restate) their claims whenever their opponent disagrees or expresses doubts or confusion. It seems that, according to Jacobs and Aakhus, therapeutic dialogues essentially differ from the other two types of discussions because feelings and emotions are put forward more than facts and opinions. As a consequence, the content itself of propositions may be different from the ones in critical or bargaining discussions.

Sections 5.5.1 to 5.5.3 provide a brief overview of the differences which can be detected in the three types of dialogues identified by Jacobs and Aakhus (2002b). It seems that critical discussion closely matches MDG while bargaining and therapeutic dialogues present new illocutionary forces which can be specified in new sets of locution rules and structural rules. MDG can therefore be considered as a generic dialogue game for mediation, closely related to critical discussion, which can be derived or further specified to capture the other types of dialogues. Two new protocols (one for bargaining and one for therapeutic) must be formalised and specified as has been done for MDG in order to deliver dialogue games which take into account the variety of dynamics in mediation dialogues. Another possibility would be to develop a mediation dialogue game which captures all three types of discussions. Similarly to Wells and Reed who developed a Bargaining Game which allows shifts between a persuasion dialogue and a negotiation dialogue (Wells and Reed, 2012), this mediation game would enable players to shift from critical, therapeutic and bargaining discussions; the shifts may be triggered by the mediator e.g. if a type of dialogue does not seem to quickly lead to consensus between parties and the mediator wants to try a different strategy.

5.5.4 Example of differences in dialogue types

A close analysis of mediation discussions which examines in detail at the development of the interactions is needed in order to allow distinguishing the patterns proper to each type of discussion. The modelling and formalisation of protocols for these dialogues is part of future work, but a first step in this direction has been made. Three sub-corpora of the DMC have been created containing analyses of mediation interactions according to the set of illocutionary forces identified in Tables 5.5, 5.6 and 5.7. These corpora are available at: `corpora.aifdb.org/critical`, `corpora.aifdb.org/bargaining` and `corpora.aifdb.org/therapeutic`.

This section aims at providing a preview (also reported in (Janier et al., 2014a)) of the differences between dialogue types in mediation discourse. Preliminary corpus analyses (stored in the three sub-corpora mentioned above), based on Tables 5.5, 5.6 and 5.7

have confirmed that mediation games (or dialogue types) possess their own properties. The goal here is to present an example of comparative structural analyses of a critical discussion game and a therapeutic game.

Consider a short fragment of the mediation critical discussion described in (Jacobs and Aakhus, 2002b, p. 187, turns 01-03) in which a divorcing husband and wife are discussing visitation arrangements for their children.[6]

(10) a. Wife: *I really believe picking them up at the house is better, because that way there's more of the ongoing consistency after school with... You know, I'm going to have to get a sitter once I get working, anyway, so...*

b. Mediator: *Then [he'll] take them to school Wednesday morning?*

c. Wife: *No, I'm not talking about overnights [pause]... I'm not talking about overnights. Our daughter is so incredibly emotionally upset right now [that] she won't even sleep unless she sleeps with me.*

The analysis of Example 10 is given in Figure 5.1.

[6]In this case, the husband wants more time with the children while the wife agrees for him to see the children one day each week (Tuesday).

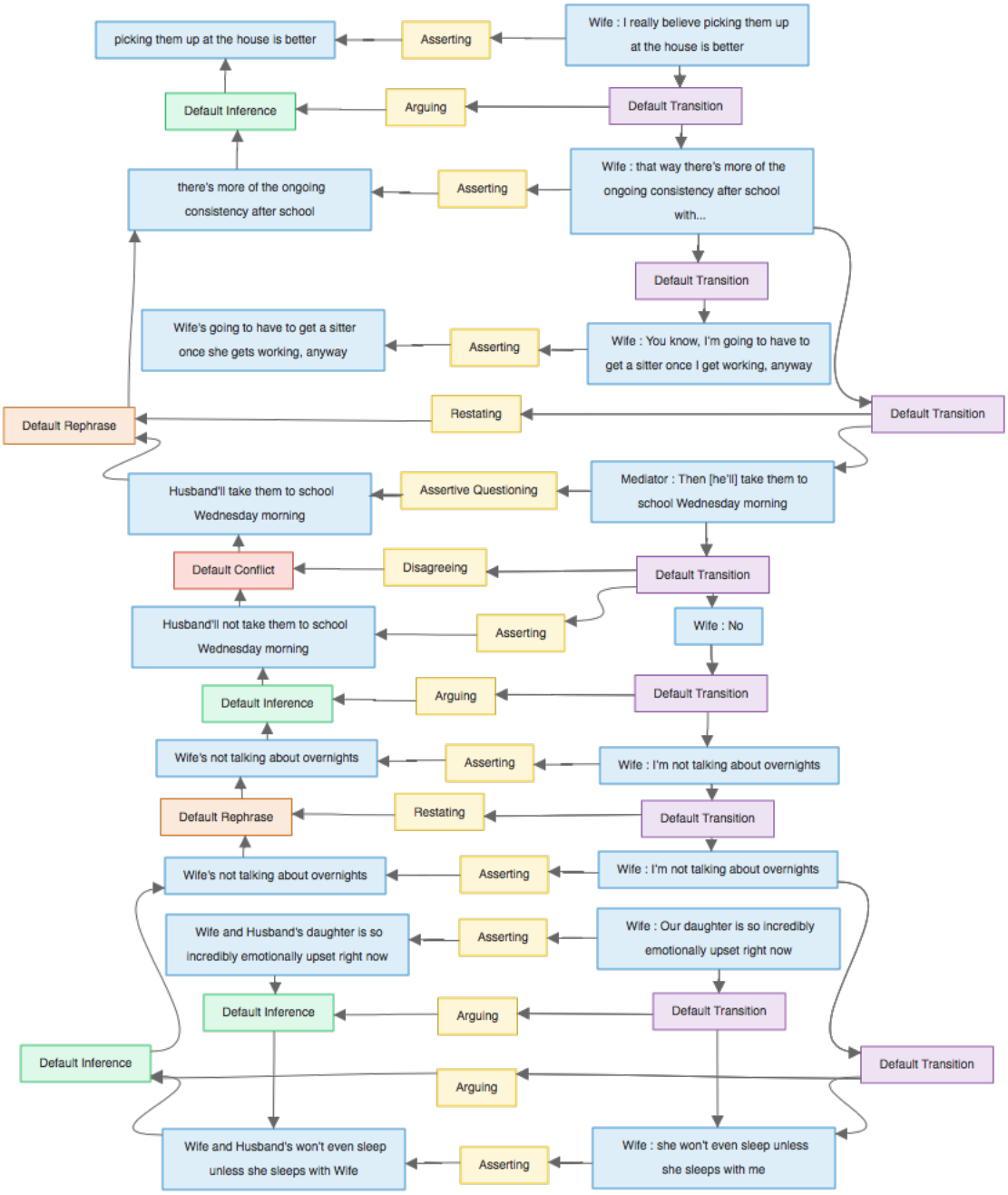

Figure 5.1: Analysis of Example 10 - Argument map#11437

In this example, the mediator suggests, via an Assertive Question which Rephrases Wife's second Assertion , that the children will be staying overnight with the husband (from Tuesday to Wednesday) and then he will be taking them to school the next morning (see 10b). Wife disagrees with such a solution and provides three arguments to support her disagreement (see turn 10c).

Now, consider a short fragment of therapeutic-style mediation taken from (Jacobs and Aakhus, 2002b, p. 199, turns 122-123) in which neighbours discuss over a barking dog: Becky brings a complaint against Luke and Cathy – owners of the dog. The example is

analysed in Figure 5.2.

(11) a. Mediator two: *Cathy, you... you... When you started talking about this, part of me feels that we should just say, "Oh, look at the dog issue." But it sounds like you have some hurt feelings that may be affected by how you feel about this dog issue. Are there some of those that you want to share without you[r] know[ing] taking it completely away from the dog issue? For some of this may be important, um, for us to know, for everyone here to hear how you feel.*

b. Cathy: *I don't know if that's relevant. I mean, she all but said she doesn't like us. And I felt, what else can be said?*

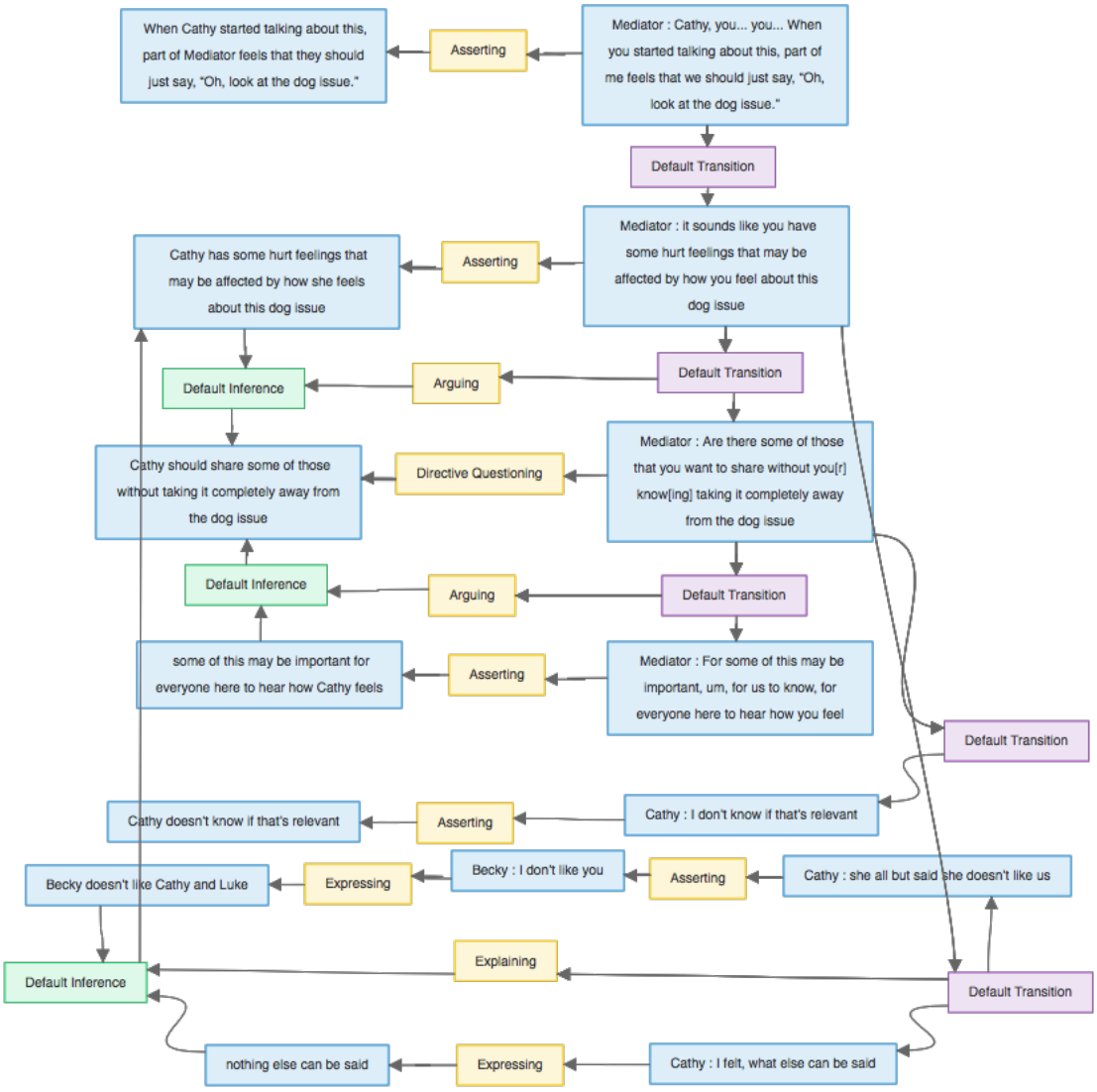

Figure 5.2: Analysis of Example 11 - Argument map#11438

In Figure 5.2, we can see that the Mediator asserts two propositions. Note that the content of the Assertions have more to do with the the content of the discussion rather

than facts, hence preserving his neutrality; the following directive question confirms this: he directs the discussion (and Cathy in particular) towards a new issue: Cathy's feelings. Mediator also supports, via an argument, his proposal. Cathy in turn, responds to the question and Mediator's concerns. Note that she reports her neighbour's words, and then expresses her feelings: this allows her to *explain* why she has "hurt feelings".

One can see that IAT captures the differences between the two types of mediation games in the following way. In 11a, the mediator encourages Cathy to *explain* her feelings. In Figure 5.2 the inference: "Cathy has hurt feelings" because "Becky doesn't like Cathy and Luke" and "nothing else can be said" is anchored in the dialogical transition via the illocutionary connection of *Explaining*. On the other hand, in the critical discussion (Figure 5.1), the inference: "The daughter cannot stay overnight with the husband" because "she is too emotionally distraught" and "won't sleep unless she sleeps with Wife", is anchored in the transition via the illocutionary connection of *arguing*. Arguing and Explaining are two illocutionary forces which capture the inferential nature of arguments; while Arguing is used for propositions about facts (see Table 5.5), Explaining is used for propositions about feelings and emotions (see Table 5.7). Explaining is here restricted to propositions about emotions although this illocutionary force can also concern facts. Walton (2004, 2006) defines explanations as premises put forward to support some claims when the respondent does not question the claim. For instance, when a patient asks a doctor for an explanation about a diagnosis or when a pupil asks a teacher why the Earth is round: the patient and the pupil do not question the diagnosis or the shape of the Earth, but they look for information to understand these facts. On the contrary, arguments consist of premises supporting a claim which the hearer remains to be persuaded of. The definition of Explaining in therapeutic dialogues relates to Walton's definition since Explaining is used when a speaker provides premises which will help her opponent understand her feelings and emotions. Mediators, indeed, often tend to make disputants aware of their feelings and to have their co-disputant acknowledge them. As a consequence, when a party mentions her feelings, mediators will ask her to explain such feelings, not to show that these feelings are true (which would trigger argumentation) but to help the other party understand them.

Illocutionary forces other than the ones proposed in the Tables have also been revealed by the analyses (e.g. Directive Questioning), further testifying to the need of close analyses to grasp the extent to which dialogue types in mediation possess their own distinguishing features. In this section, we have seen that IAT allows capturing the differences between the three types of discussion identified by Jacobs and Aakhus (2002b). Carrying additional analyses of mediation dialogues according to their types will provide a better understanding of the mediation process and will bring important information as to the profiles of each style of discussion. The methodology applied in Chapter 4 and Section 5.2 will allow defining the characteristics for each type of discussions. We have seen in Section 5.5.1 that MDG already models most of the features of critical discussions: this testifies to the adequacy of the game to capture the main characteristics of mediation dialogues. MDG being minimally specified, it will be possible to either extend its rules so that features of the therapeutic and bargaining discussions can be included, or else, MDG can be declined into two other games, with different protocols which take into account the dialogical and argumentative characteristics of these types of dialogues.

5.6 Summary

This chapter has presented a dialectical system for dispute mediation dialogues: MDG. First, a set of rules, founded on empirical and corpus studies, has been formulated to describe and constrain players' behaviours. The empirical investigation of mediation dialogues has therefore led to the definition of rules, which can be seen as norms. This approach shows that empirically-based studies have been necessary to provide a normative model. The rules have then been specified using DGDL, which ensures an easy and standardised implementation of the game in conversational support systems. The formal specification presented in this Chapter allows to see mediation from a normative point of view. The rules have been formulated thanks to the empirical studies of the discourse presented in Chapter 4. The dialogue game can therefore be compared with and weighted against real mediation dialogues, as will be shown in the following chapter. Second, this game expands theoretical knowledge of dialectical systems by building upon already developed systems but extending some features. For example, the game includes

commitment-stores as in (Walton and Krabbe, 1995) for three players, as in (Prakken, 2008). The main difference between MDG and other dialogue games lies in the way it handles argumentation: arguments are a final result of the interactions in MDG (Pure Challenges followed by Assertions), and Arguing is not defined as a possible locution; this is representative of the reality of dialogues, as corpus studies have demonstrated in Chapter 3. In contrast, most games in the literature provide an Arguing move and do not take into account the dynamics of dialogical interactions to create arguments. MDG therefore shares commonalities with standard formal dialectical systems, but also presents its own characteristics to capture mediation discourse distinctive features.

Being minimally specified, MDG can be derived to account for other mediation discourse subtleties. For instance, as we have seen in Section 5.5, Jacobs and Aakhus identified three types of discussions in mediation (critical, bargaining and therapeutic) (Jacobs and Aakhus, 2002b). Insights from IAT analyses of two types of discussions have revealed some differences in structure and content of arguments which, as part of future work, could be modelled and formalised. It will then be possible to further specify MDG to play these three different types of games.

To conclude, MDG is a minimally specified dialogue game which captures the basic characteristics of mediation dialogues. In order to account for the wide array of mediation moves, more analyses of the DMC must be carried out in order to identify, model and formalise the complexity and diversity of mediation dialogues. Including new rules to extend MDG offers the advantage of extending and building upon it to make it closer to the reality of mediation dialogues. Finally, as will be shown in Chapter 6, this game also has a practical impact: implementing MDG in conversational support systems provides the opportunity of delivering a computational tool which trainee mediators could use to test and improve their techniques on their own, or without having to be in the same room as their supervisors.

Chapter 6

Evaluation

Most works on dialectical games and agent communication have focused on delivering tools which evaluate argumentation. For instance, they intend to determine what arguments are the most convincing and track the changes of parties' beliefs along discussions (see for example Budzynska et al. (2008)). As emphasised by Prakken (2006), initially, dialogue games have been developed in philosophical logic and argumentation theory because they provide a normative view of dialogues. For instance, they allow the study of dialogues without fallacies as in (Hamblin, 1970).

The previous chapter has presented a dialogue game for mediation. MDG can be used as a normative framework; by contrasting mediation discussions with the rules of the game, it is possible to put into relief the properties of mediation dialogues. MDG, however, has been designed as a tool for mediators' training: by replicating mediation dialogues in a computational environment, constrained by empirically built rules, mediators can practice their techniques and strategies. In addition to representing a normative view of mediation dialogues, MDG can be executed in order to deliver a practical tool by taking advantage of computational advances. The motivation behind this is that, despite its increasing popularity, mediation has not benefitted from technological advances which could support the practice.

The aim of the current chapter is to establish an existence proof. Analysing real mediation dialogues and comparing them to MDG rules will allow determining whether the rules of the game correspond with actual dynamics in mediation. As we will see, this task will also lead to the discovery of dynamics which are not covered by MDG rules. Con-

sequently, the game will be revised in order to include rules modelling them. A formal analysis could allow checking the validity and robustness of MDG before implementing it. Relying on formal analysis to validate the system would mean to mathematically compute the different behaviours of MDG. Such a method, however, would put an emphasis on logical aspects of the system rather than on its linguistic aspects. As a consequence, in the present study, the undertaken evaluation task relies on empirical and contrastive methods: real mediation dialogues are compared with MDG rules to verify whether the game effectively, and to a large degree, corresponds with the dynamics in mediation discussion.

In Sections 6.1 and 6.2 excerpts of mediation dialogues from the DMC are compared with MDG rules. The goal is to verify that dialogical dynamics in mediation sessions are captured by MDG rules. This is necessary to ensure that the rules of the dialogue game indeed take into account mediation participants' majority of behaviours. After the introduction in Section 6.4.1 of a framework and a system which can be used to execute dialogue games, Section 6.4.2 shows how a mediation dialogue game is executed in such a system. This last step of implementation ensures that the game is computationally usable.

6.1 Evaluation of MDG

6.1.1 Motivation

The Mediation Dialogue Game, presented in Chapter 5, has been created by taking into account three types of data. First, empirical knowledge provided by the literature has been used to help capture the essence of mediation dynamics: for instance, it is acknowledged that mediators must stay neutral in the face of disputants and their positions, as a consequence, a rule has been defined to prevent M (the mediator) from making Assertions. Indeed, if a speaker asserts a position, it is meant to convey an opinion; yet, mediators are not supposed to do so, this is why M cannot make Assertions in MDG. Next, statistical analyses carried out after the in-depth analyses of mediation dialogues (see Chapter 4) have helped define the locution rules: knowing that asserting, agreeing and assertive-questioning, for example, are frequent illocutionary forces in mediation discourse, these have been added as available moves to players in MDG. Then, IAT fine-grained analyses

have provided insights with respect to how dialogical dynamics create an argumentative framework in mediation: in particular, the modelling of some important characteristics of mediation discussions have allowed determining the typical structure of mediation dialogues. This has been captured in MDG through a combination of locution rules and structural rules. Finally, MDG is designed in the style of standard dialectical games: for instance, a set of commitment rules has been expressed in order to keep track of the players' positions so that the speakers' commitments are stored and revised along the discussion.

The design of MDG rules therefore takes into account knowledge in mediation discourse, provided by insights from the literature in the domain (Chapter 2) and close analyses of mediation dialogical and argumentative dynamics (Chapter 4). It is however necessary to verify whether the game, as defined in Chapter 5, corresponds with the reality of mediation dialogues. MDG is only a first step towards the modelling and implementation of a system for mediators and does not claim to be a ready-to-use tool yet. Therefore, for now, MDG is not an end-user game, but it is crucial to (i) make sure that the game in its current form is close to real mediation dialogues, and (ii) detect its limitations. For this, it is important to verify whether MDG rules are moves which do happen in mediation. Therefore, additional analyses of mediation dialogues are required to allow a careful comparison between actual mediation dynamics and the structural rules of MDG.

To do so, in the following sections, excerpts of two transcripts of mediation sessions (one real, and one mock-mediation) are analysed and compared with the set of rules written for MDG in order to evaluate the soundness of the game, and, as a consequence, the possibility of playing it in a computational environment. It will be shown that although most of MDG rules are actual mediation dialogical dynamics, the dialogue game can be revised to incorporate rules which make it closer to mediation dialogues. The new game thereby defined will be executed in a conversational support system, providing the opportunity to verify its computational usability and correct definition. This evaluation task is necessary to make sure that the dialogue game is comparable to mediation dialogues and easily implementable as a tool for trainee mediators.

For clarity purposes, and better legibility of the figures whenever long extracts are

provided, some of the excerpts below are analysed in several figures. As mentioned in Chapter 4, the reader can consult the complete analysis of each example by accessing the OVA+ tool online. Each analysis has its own identifier, given in the captions of the figures throughout this chapter; please access: `arg-tech.org/AIFdb/argview/xxx` and replace xxx by the argument map identifier. The webpage presents the argument structure of the excerpts; to access the complete analysis, that is, the full IAT analysis, click on Menu - Edit with OVA+, in the top right corner. As an example, the first analysis presented in this Chapter has the argument map identifier #10725: it is accessible at `arg-tech.org/AIFdb/argview/10725`.

6.1.2 Comparing real mediation dialogues with MDG

Example 12 is the beginning of a real mediation session (see Section 4.1) which involves two co-workers Lauren and Alice and one mediator. At turn 12a, the mediator asks two questions. He asks both disputants these questions: Lauren answers at turn 12d and Alice at turn 12g. Let's analyse this example and compare it with the rules of MDG. Long passages in which the mediator asks which disputant will answer first, and in which he summarises Lauren's contribution, have been removed for a clearer representation in IAT.

(12) a. Mediator: *what are the things we need to tackle and what do you hope to get out of this?[. . .]*

b. Lauren: *So what do we want to tackle?*

c. Mediator: *What do we need to deal with and what do you hope to get from it?*

d. Lauren: *I think I feel as if we've never really worked as a team, so I think we need to come together a bit more. Communication is obviously a big one so if we tackled the communication that would maybe benefit us in other areas.*

e. [. . .]

f. Mediator: *So same question, yeah?*

g. Alice: *Basically I want to try and get the erratic nature of the relationship out of the road because I just feel that, like I said to you before, I never know if I'm going to get something back that's negative or not quite-*

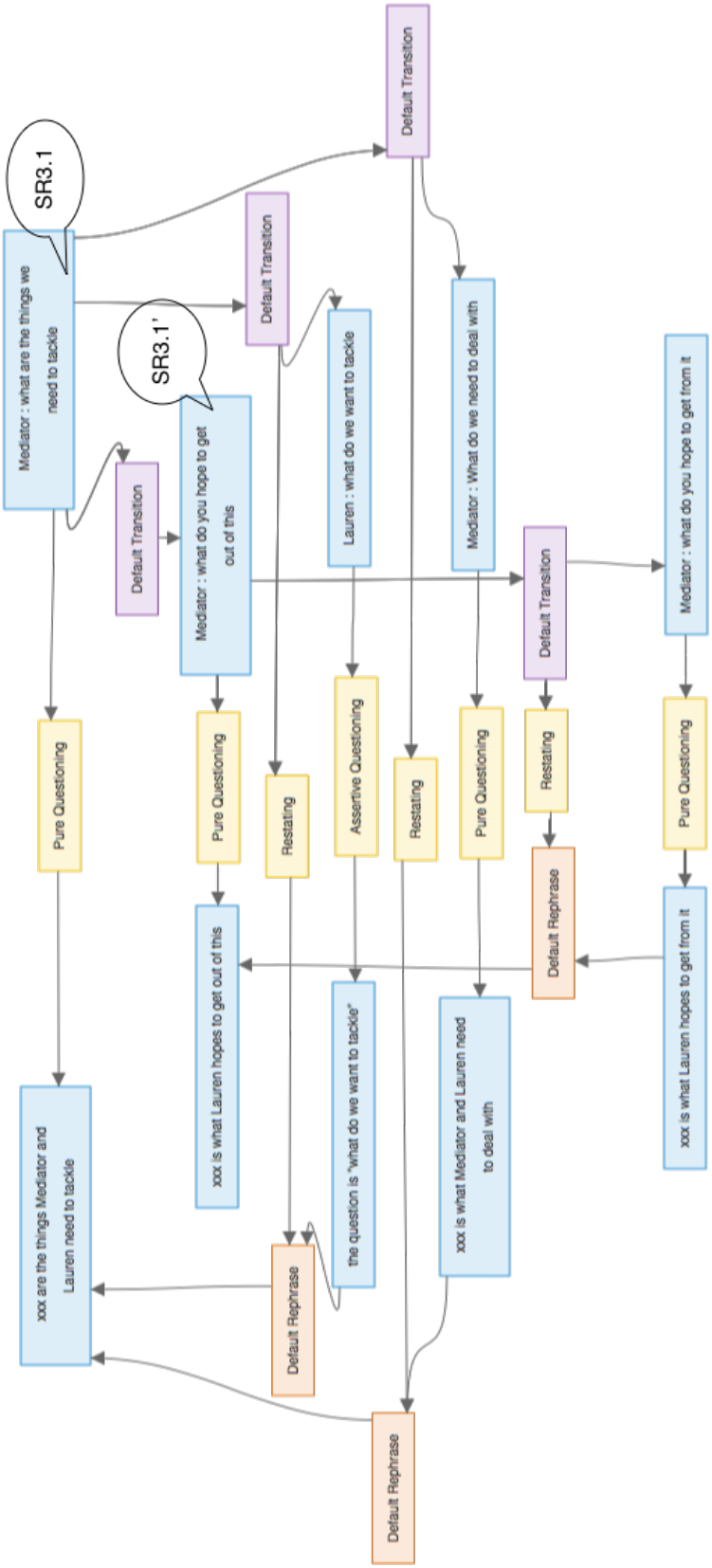

Figure 6.1: Analysis of Example 12, turns 12a to 12c - Argument map#10725

Figure 6.1 is the analysis of turns 12a to 12c. It shows that the mediator's questions are Pure Questions, which the first party, Lauren, answers after restating one of them: see the first Default Rephrase node. What Lauren is doing is asking, via an AQ, if she correctly understood the question. As an answer to this request, Mediator, in turn, restates both questions (see the second and third Restating nodes).

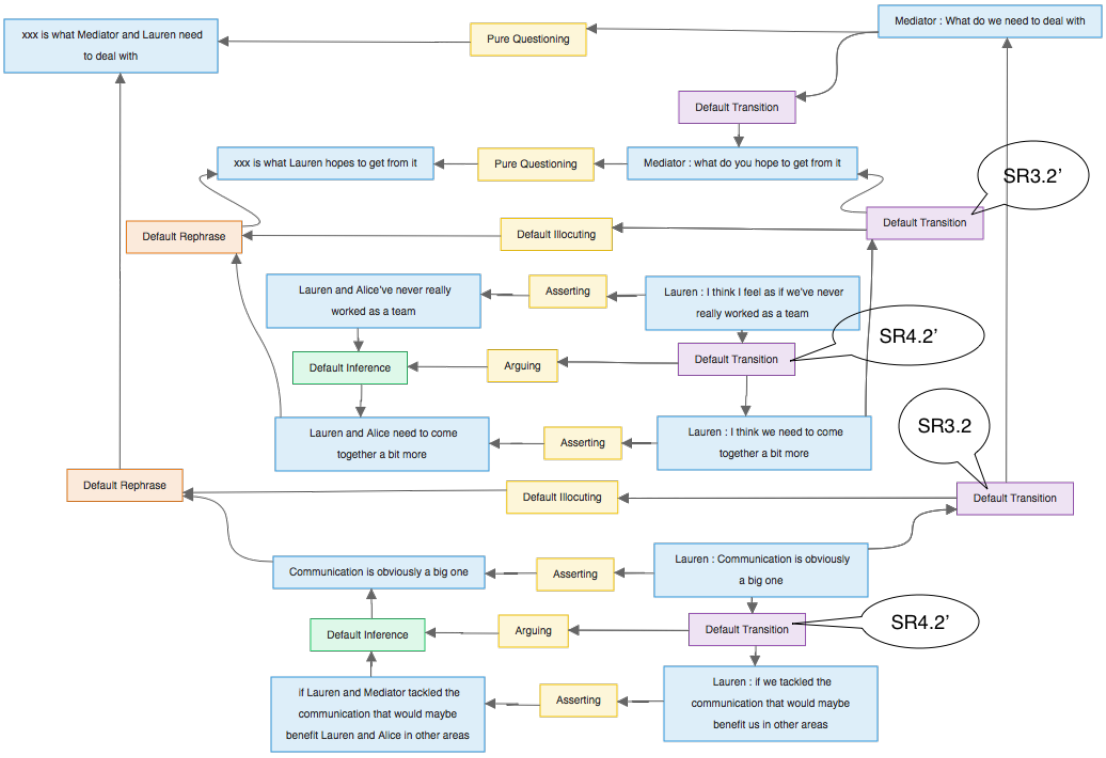

Figure 6.2: Analysis of Example 12, turns 12c to 12d - Argument map#10725

Figure 6.2 is the analysis of turns 12c to 12d. Lauren's response consists of four Assertions, only two of which are actually the answers to Mediator's two questions: see the Default Transition nodes linking her second and fourth Assertions to the mediator's Pure Questions; the other two Assertions allow her to argue: the first and second Assertions form an argument, and the third and fourth ones form another argument, with the first and third acting as supports for the answers to the Pure Questions.

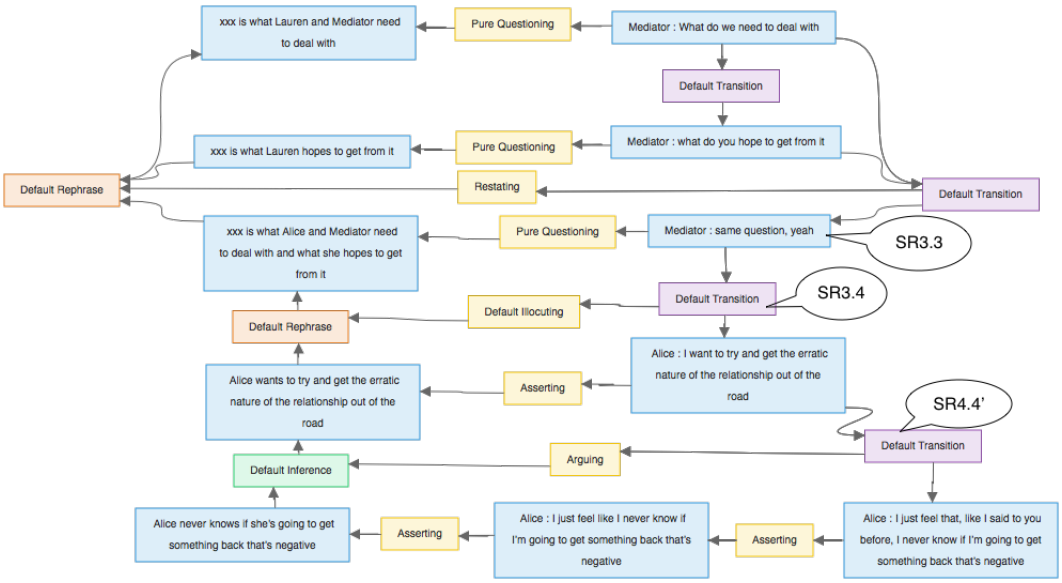

Figure 6.3: Analysis of Example 12, turns 12c and 12f to 12g - Argument map#10725

Figure 6.3 is the analysis of turns 12c and 12f to 12g; it shows that after Lauren's two arguments, Mediator restates again his Pure Questions: he now asks them to Alice, the second party. Alice then responds with two Assertions: one to answer Mediator's question and one to support her claim: see the Arguing node showing that the second Assertion is the premise for her argument.

This dialogue which initiates the mediation session can be compared with the first rules of MDG. In MDG, SR3.1 forces M to move first with a Pure Question to P_1 about t (that is, a question about the topic of the dispute). In Example 12, Mediator's two Pure Questions are questions which initiate the session: what the issues to be broached are, and what the parties expect from the mediation. In MDG, however, M can only ask one PQ while, here, he is asking two questions; therefore, only the first one can be considered as matching MDG rules.

Let's propose thereafter notations and definitions for the dialogue rules which are close to MDG rules but need a refinement to accurately capture the dynamics analysed, and identify them with the symbol $'$. SR3.1$'$ can thus be defined as follows:

SR3.1$'$ | M moves first with either one or more moves of the type PQ(t) addressed to P_1

Lauren who assertive-questions the mediator and restates his question is performing moves which are forbidden in MDG: locution rules only allow parties to assert, agree, disagree and withdraw. Similarly, despite a locution rule allowing M to restate, Mediator's

move here, that is, restating his own questions, is not allowed in MDG. In Figure 6.2, we can see that Lauren answers Mediator's questions with two Assertions. Given that the second PQ does not exactly match MDG rules, only Lauren answering the first question can be considered as matching the rules of the game too, as specified by SR3.2 (i.e. after M performed $PQ(t)$, P_1 must answer with $A(p)$), and her answer to the second PQ is labelled SR3.2′, as the second PQ has been labelled SR3.1′. SR3.2′ can therefore be defined as:

SR3.2′	P_1 must answer with several moves of the type A(p) iff M has performed several moves of the type PQ(t)

SR3.3 and SR3.4 state that M must ask the same question to P_2, who then must answer with a move $A(q)$. This is exactly what is happening in the Example (see Figure 6.3): Mediator asks the same question, although this question is restated (see that the propositional content of the question only has one different word: the name of the disputant), and the disputant answers with an Assertion.

Finally, in the game, M must challenge the parties' positions and the parties must answer with $A(r)$ and $A(s)$ (SR4); in the example, Mediator does not challenge Lauren or Alice, however they both provide support for their claims: the spirit of SR4.2 and SR4.4 (i.e. P_1 and P_2 providing support for their first claims) is therefore obvious in this real dialogue although SR4.1 and SR4.3 (i.e. M's challenges) do not appear. As a consequence, the relationship between the parties' claims which create argumentation are labelled as corresponding to SR4.2′ and SR4.4′ because disputants argue even if they have not been challenged. SR4.2′ and SR4.4′ can be defined as:

SR4.2′	P_1 can perform a move of the type A(r) right after A(p) providing that A(r) represents a premise for A(p)
SR4.4′	P_2 can perform a move of the type A(s) right after A(q) providing that A(s) represents a premise for A(q)

These differences are not surprising: as we have seen in Chapter 5, a locution rule has been defined to authorise M in challenging P_x although a small number of challenges have been found during corpus analyses. This locution was defined in order to follow dialectical games standards which usually define such a rule to enable argumentative moves; the analyses of real-life dialogues however had shown that participants in a discussion argue,

that is, provide their claims with supports, without having to be challenged: this is exactly what is happening in this example. Lauren and Alice argue even though Mediator did not challenge them. Another significant difference between this dialogue and MDG rules is that, in Example 12, some of the illocutionary forces of the disputants' contributions are not authorised in MDG locution rules: here, Lauren uses an Assertive Question, and she and Alice restate some propositions. Also, they both perform several moves per turn, which is forbidden in MDG by rule SR1. These differences are due to the fact that MDG rules were defined to only allow P_x and P_y to make claims while more strategic moves are authorised to M, because he is in charge of the dialogue.

Let's now have a look at a second excerpt taken from the same transcript and analyse it. This is the continuation of the discussion between Mediator, Alice and Lauren. In this example, Alice explains to Mediator that the person she and her colleague Lauren take care of, Katy, has changed and is now more open than before.

(13) a. Alice: *She's more open.*

b. Mediator: *Right so you would agree with that?*

c. Lauren: *Yeah.*

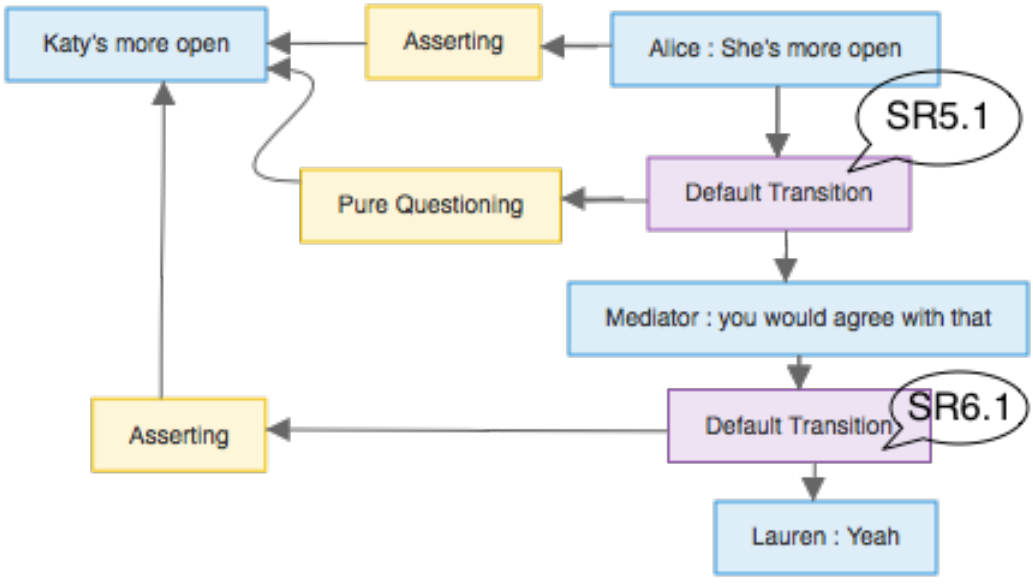

Figure 6.4: Analysis of Example 13 - Argument map # 10780

Figure 6.4 shows that Alice is asserting a proposition. Next, Mediator is asking the other disputant a PQ. As a response, Lauren, answers "Yeah": this means that she is

committed to the content of the question: see in the Figure that this is as if she had asserted the propositional content of the question. Remember that a positive response to a PQ does not entail agreement; rather, it means that the speaker is committed to the propositional content of the question while, a positive answer to an AQ does entail agreement (since the questioner gives his own opinion by asking a question).

If we compare this short dialogue with MDG rules, we can see that the relationship between the first two moves corresponds with rule SR5.1, which stipulates that when a party asserts a proposition p, M can pure-question the other party about p. Lauren's answer at turn 13c is a move which is allowed in MDG: rule SR6.1 authorises P_x to assert a proposition as a response to a PQ. Therefore, in this short example, two of MDG structural rules have been detected: SR5.1 and SR6.1.

Let's now take another excerpt from the same transcript. This time, the mediator and parties are tackling a new issue: Lauren thinks that if Employer had employed more people instead of increasing Alice's contract, there would have been fewer problems between them and their colleagues. The analysis of the excerpt is given in Figure 6.5.

(14) a. Lauren: *We would be in a totally different situation now.*

b. Mediator: *Really, in what way?*

c. Alice: *Yeah.*

d. Lauren: *Because then they would have maybe employed Alice, say, with the 10 hour contract that she's got, that would be 34, and then somebody else with a 6 hour contract being flexible.*

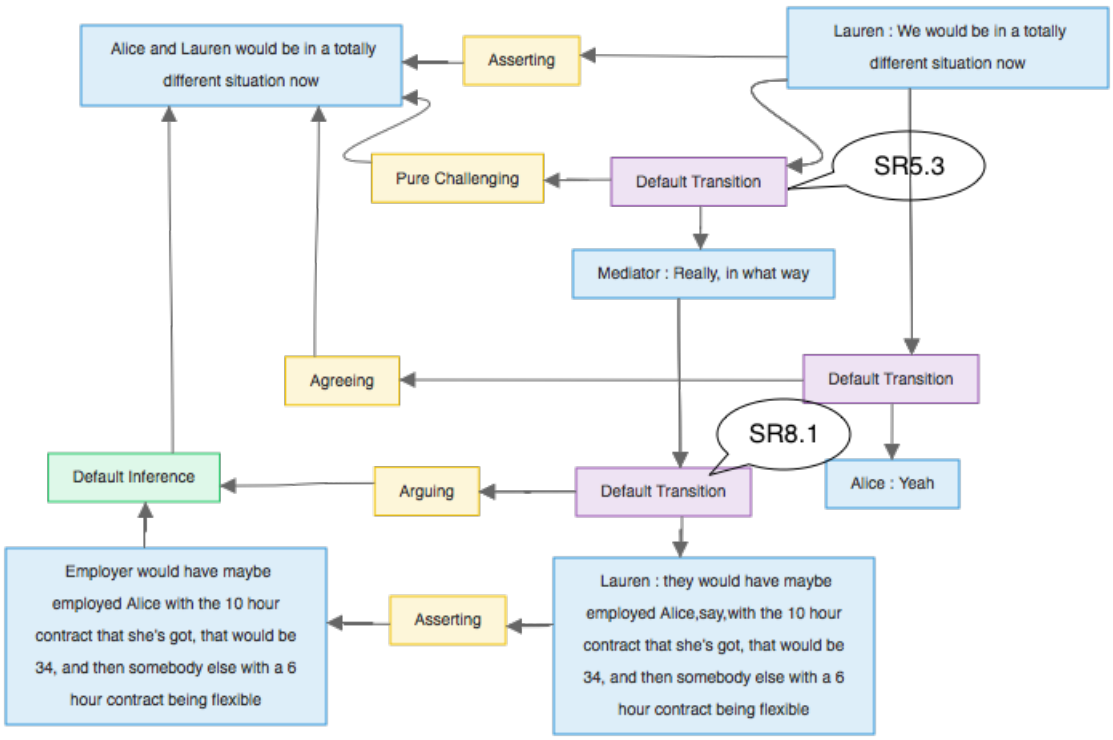

Figure 6.5: Analysis of Example 14 - Argument map # 10873

In Figure 6.5, one can see that at turn 14a Lauren asserts a proposition and at turn 14b, Mediator is challenging her. At turn 14c, Alice agrees with Lauren, and Lauren answers Mediator's challenge at turn 14d by performing an Assertion.

The analysis of the dialogue in Example 14 shows that some of the discussants' moves match rules of MDG, while others are prohibited. First of all, Mediator is challenging Lauren, which mirrors rule SR5.3: Mediator pure-challenges a party after she asserted a proposition. Lauren responding to the challenge at turn 14d also matches SR8.1. The fact that Alice agrees with Lauren is prohibited behaviour in MDG because the game seeks to offer M a maximum of possibilities to implement strategies; if both parties agree, M does not have to intervene, therefore, preventing parties to agree allows M to look for their agreement via moves such as Assertive Questions.

The following excerpts are taken from another transcript but, this time, it is a mock-mediation, that is, a role-play. In this role-play, Sean and Nancy are two parties playing the role of co-workers who want to resolve a dispute, and Melissa and Kelly are two mediators. One of the main issue tackled during the mediation is that Nancy feels that Sean is making fun of her and does not respect her and her work. The next dialogue deals with this issue:

(15) a. Melissa Myer: *So when Sean makes these jokes, you feel like you're being attacked in those jokes?*

b. Nancy Butler: *I do.*

c. Melissa Myer: *Okay, and feeling that way is valid because you're the one that feels that way. Sean, do you want to add anything to your summary?*

d. Sean McNeil: *She's not the centre of the universe. I have 45 people in my department and she's the only person that's a thorn in my backside.*

e. Melissa Myer: *Sean, I heard Nancy say that she feels like you attack her with your jokes, and when you say that she's not the centre of the universe, it sounds like maybe you don't intend to target those jokes towards her?*

f. Sean McNeil: *I make jokes towards myself.*

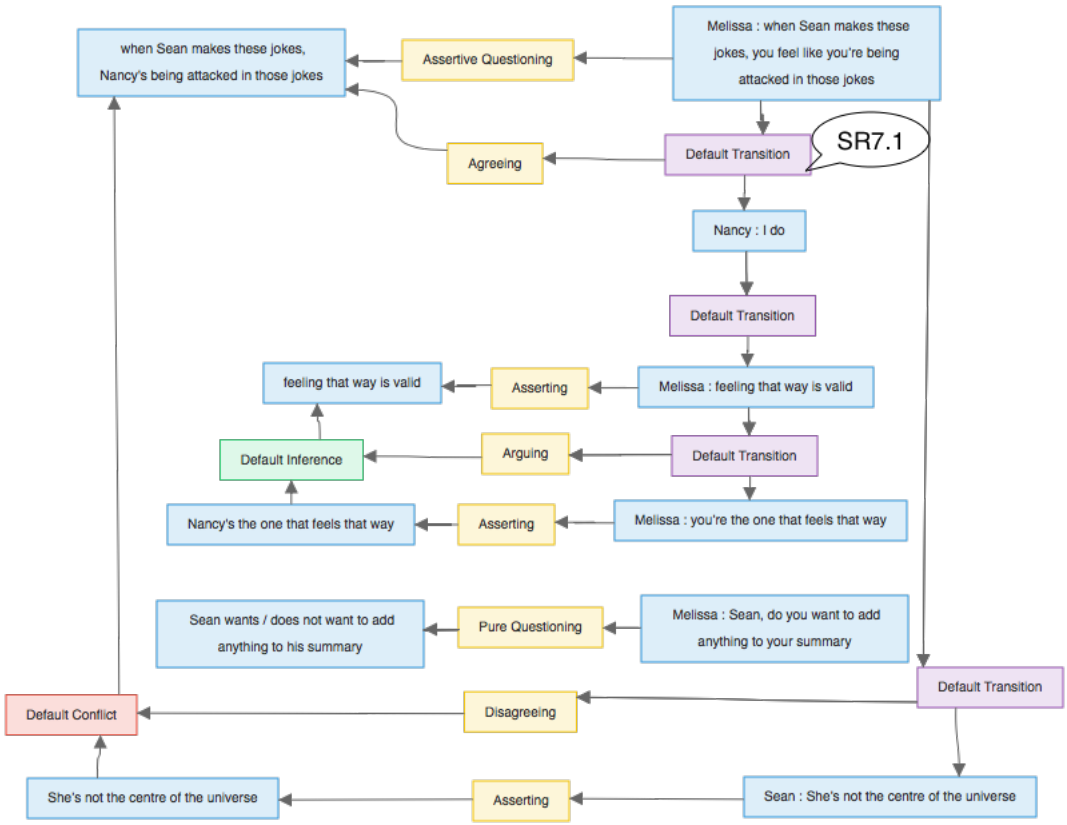

Figure 6.6: Analysis of Example 15, turns 15a to the beginning of turn 15d - Argument map # 10872

Figure 6.6 is the analysis of turns 15a to the beginning of turn 15d. It shows that Melissa assertive-questions Nancy who agrees and then asserts two propositions which form an argument. She then asks a PQ to Sean who answers with an Assertion in conflict

with the mediator's first proposition, meaning that he disagrees.

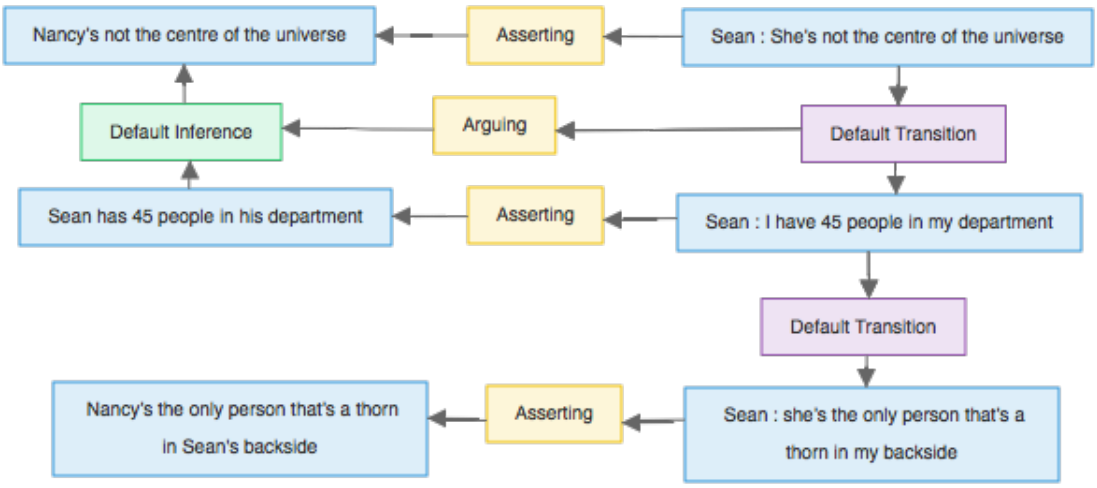

Figure 6.7: Analysis of Example 15, turn 15d - Argument map # 10872

The analysis of the following moves (Figure 6.7) shows that, then, Sean asserts two propositions, and one of them allows him to create an argument, with his first proposition being the conclusion.

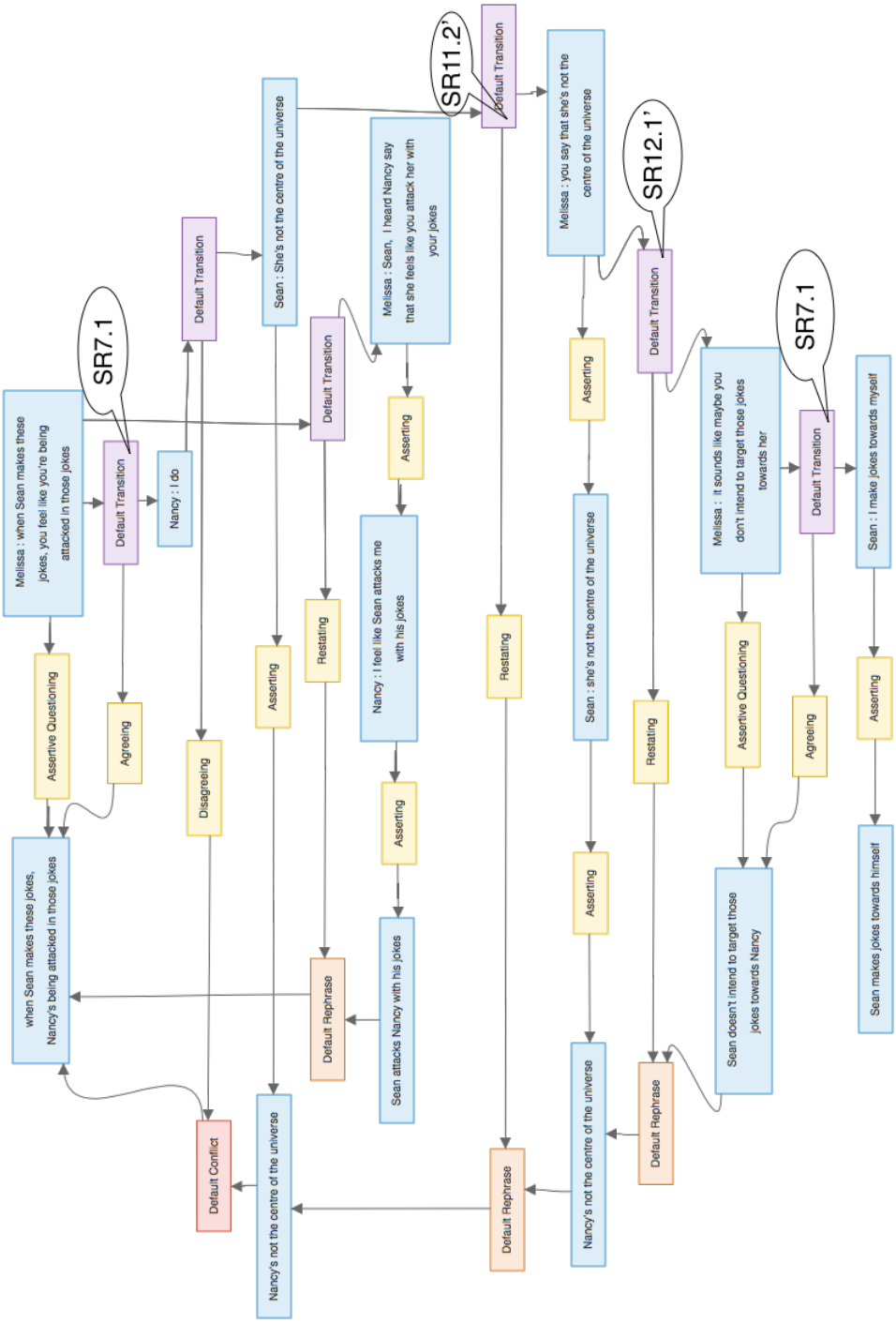

Figure 6.8: Analysis of Example 15, turns 15a and 15e to 15f - Argument map # 10872

Figure 6.8 shows that at turn 15e, Melissa is reporting the disputants' speech: she first reports what Nancy 'said' at turn 15b (Nancy had agreed with the propositional content of Melissa's question, she did not uttered this proposition, but is supposed to be committed to it) and what Sean said at turn 15d, which means that the mediator is restating these propositional contents. Melissa then poses an AQ to ask Sean whether he agrees with her restatement. As an answer, Sean asserts a proposition to agree.

This example contains moves which are allowed in the definitions of MDG, and others which are not. In the first figure, the fact that Nancy agrees with the mediator's AQ, is a behaviour allowed by rule SR7.1. In this same figure, however, the mediator is asserting and arguing; these are forbidden moves in MDG, as is the possibility of pure-questioning after performing all these moves. Moreover, the fact that Sean does not answer the mediator's PQ and, rather, directly disagrees with the content of the AQ she had asked his co-disputant and that he also performs several moves in one single turn and argues without being challenged (second figure) is forbidden too by MDG rules. In the last figure, we have seen that the mediator restates both parties' words. In MDG, M is allowed to restate, only after a party disagreed, to check whether the fact that she disagrees with a proposition p means that she is committed to the opposite proposition $\neg p$. Here, Melissa restates Nancy's words although she did not disagree, therefore this is not a behaviour captured by the rules of the game. However, the fact that she also restates Sean's disagreement is close to rule SR 11.2: the mismatch between this example and the rule as defined in MDG is that the restatement can only directly follow the party's disagreement; here, Melissa restates Sean's disagreement after both he and she performed several other moves. SR11.2′ can be defined as:

SR11.2′	M can perform a move of the type R($\neg p$) after P_x has performed several moves after A($\neg p$)

Similarly, in MDG, after M performed R($\neg p$), she must perform AQ($\neg p$). In this dialogue, Melissa performs an AQ right after she restated $\neg p$, however, the content of the AQ is not exactly $\neg p$: it is a Rephrase of $\neg p$. The content is therefore similar, but is not identical; which is why this move is not exactly what MDG captures in rule SR12.1. SR12.1′ can therefore be defined as:

SR12.1′	M can perform a move of the type AQ($\neg q$) after R($\neg p$) iff $\neg q$ is a Rephrase of $\neg p$

Finally, the fact that Sean answers to the AQ by agreeing is captured by rule SR7.1.

Let's now turn to Example 16 which is an excerpt of the discussion between Nancy and the mediators during a caucus.

(16) a. Melissa Myer: *Worst-case scenario: you guys don't agree today and you're both gone. Best-case scenario: we figure out some way that you're able to work together, be productive and not undermine the integrity of the organisation somehow?*

b. Nancy Butler: *Yes.*

c. Kelly Tansik: *I'm going to go ahead and skip ahead just a little bit because I want a better idea of... It sounds like in a perfect world, your perfect solution was to get rid of Sean, but that's not going to happen, right?*

d. Nancy Butler: *Right.*

e. Kelly Tansik: *Can you just give us an idea, so we have a better understanding...? Again, we won't share this with Sean unless you want, but what do you see as a possible solution?*

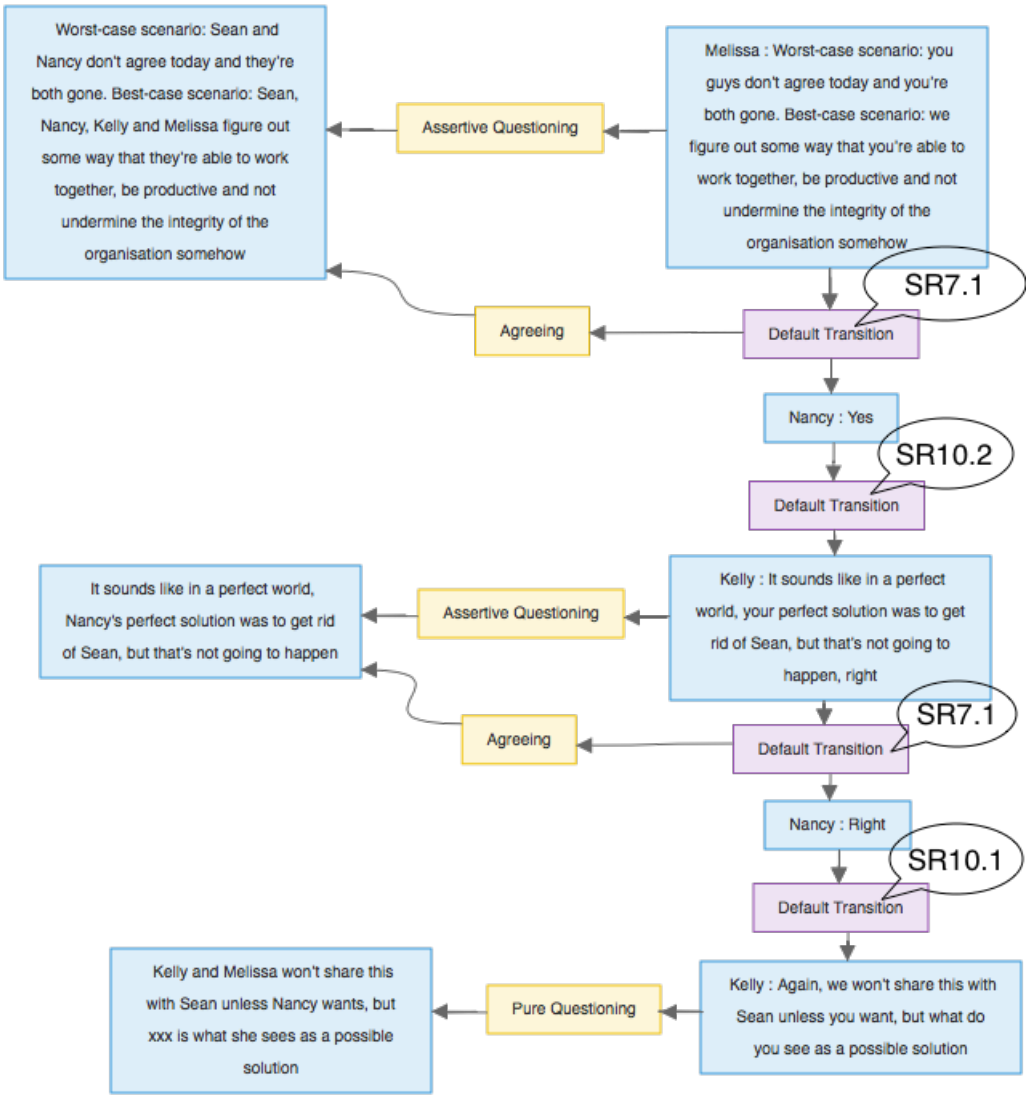

Figure 6.9: Analysis of Example 16 - Argument map # 10821

The analysis in Figure 6.9 shows that, first, Melissa assertive-questions Nancy who agrees. Then, Kelly asks an AQ, and Nancy agrees again. Finally, Kelly asks a Pure Question. All the illocutionary forces in this example are available in MDG: M can ask pure or Assertive Questions, and parties can agree. The way the speakers are discussing also matches MDG structural rules. Indeed, MDG allows P_x to agree after an AQ (SR7.1), and allows M to assertive-question (10.2) or pure-question (10.1) P_x or P_y after P_x agreed. Eventually, this example shows that MDG constrains several dialogical and argumentative behaviours which happen in mediation discussions.

In next example, Nancy explains that she feels that Sean disrespects her at work whenever he makes a joke.

(17) a. Melissa Myer: *It sounds like it's not necessarily his joking and teasing man-*

ner that both you. It's the moments that he takes?

b. Nancy Butler: *What he chooses. It's like: "Would you shut up so I can tell my joke?" That's what I experience.*

c. Sean McNeil: *That's not what I say.*

d. Melissa Myer: *Do you understand how Nancy could feel that way by being interrupted?*

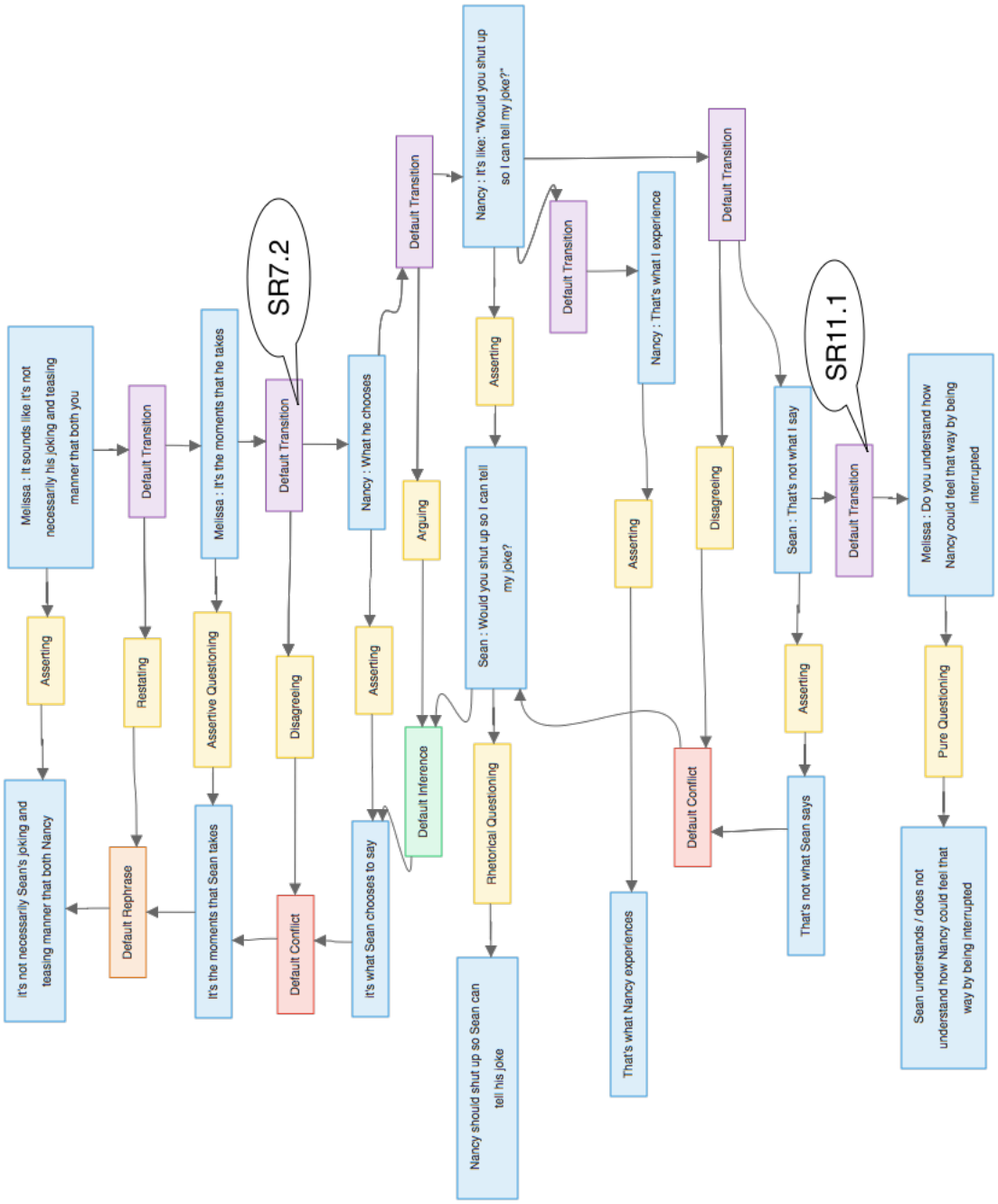

Figure 6.10: Analysis of Example 17 - Argument map # 10863

The analysis shows that the mediator is asserting a proposition which she then restates under the form of an Assertive Question. Nancy disagrees and reports Sean's words in order to argue: the premise of her argument is Sean's locution. She finally asserts another proposition, and Sean shows that he disagrees with Nancy, but his disagreement is not about a proposition, he rather disagrees with the reported-speech, which means that he disagrees with the fact of having said what Nancy reported in the previous turn. To finish, the mediator asks a PQ.

Once again, some moves found in this dialogue are not allowed in MDG: for parties, arguing, disagreeing with the opponent, reporting someone's speech, and performing several moves in a single turn are forbidden in the game, as is asserting for the mediator. However, some patterns present in this exchange are close to what MDG constrains: Nancy is answering the mediator's Assertive Question, which is defined by rule SR7.2, and the mediator is asking a PQ after a party disagrees (here, both parties disagree) is comparable to SR11.1.

In Example 18, Nancy is responding to Sean who asked her not to undermine his authority by talking behind his back. Nancy says that she would never talk behind his back, but Sean responds that she mentioned an event which he has not heard of.

(18) a. Nancy Butler: *I will not say something that I wouldn't say directly to you to others.*

b. Sean McNeil: *Okay. Keep that in mind. You said you were in the bathroom crying because I hurt you, but you never told that to me, so I didn't know how you felt. Then, you brought it to the company and complained to them, so that's a situation where you wouldn't tell me to my face, but you told someone else.*

c. Melissa Myer: *Does your company have any kind of grievance process?*

d. Sean McNeil: *No.*

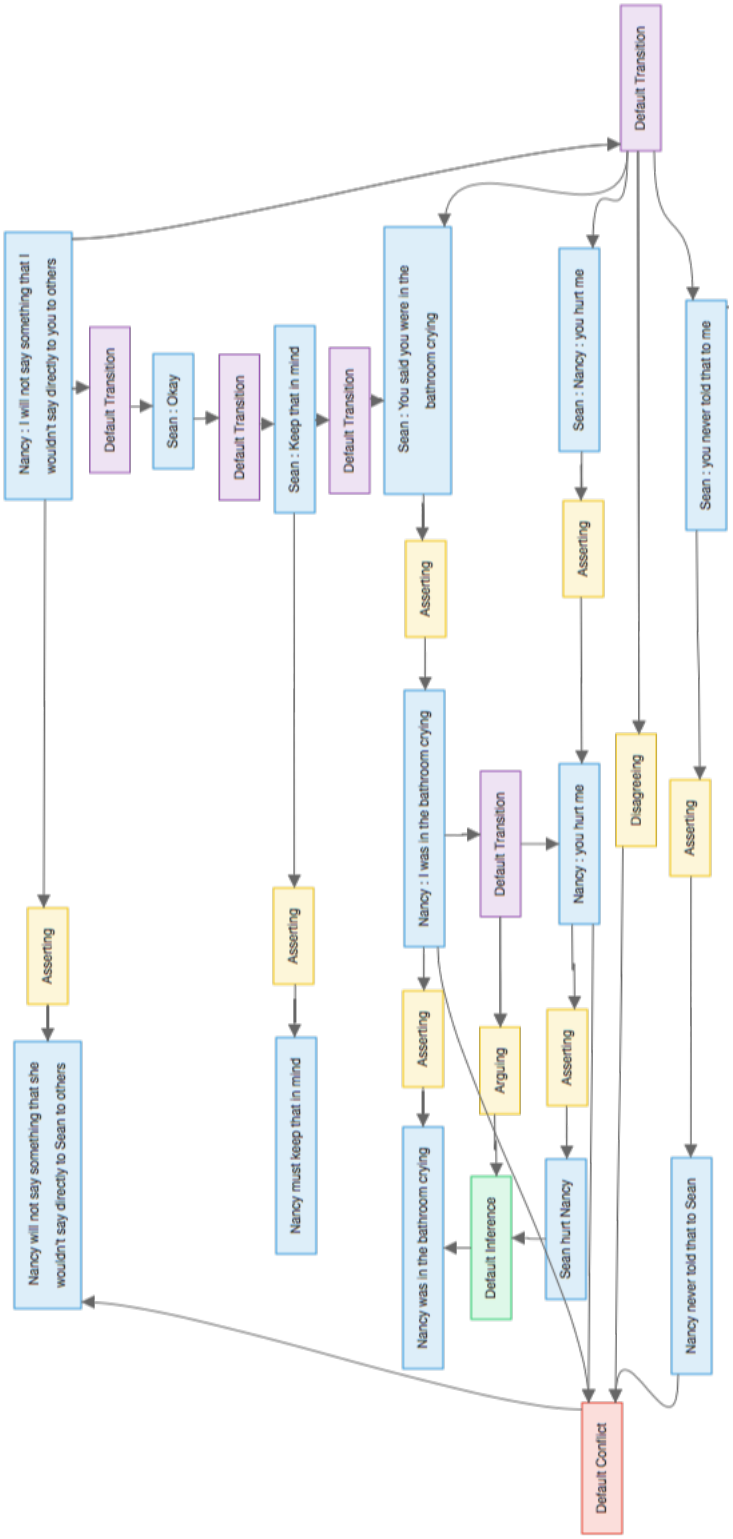

Figure 6.11: Analysis of Example 18, turn 18a and beginning of turn 18b - Argument map # 10792

The analysis of turn 18a and the beginning of turn 18b, analysed in Figure 6.11 shows that Nancy asserts that she would never tell anyone else anything she would not directly tell him. Then Sean reacts by reporting Nancy's words (what she has said to their boss). See that Sean is reconstructing an argument: the Default Transition nodes between the two reported speeches show that the argument is not his, but hers. However, the relationship between Nancy's and Sean's locutions reveals that he disagrees: the fact that she said something he was not aware of to the company proves that she did say something to others about Sean, but not directly to him. Note that Sean's counter-argumentation reveals a singular pattern: the counter-argument is not built with simple proposition contents, as was the case in the previous examples, but with one proposition and two locutions. What marks the conflict is not the fact that Nancy was crying because he hurt her; it is rather the fact that she said so to the company coupled with the fact that she did not say it to him before which allows Sean to disagree.

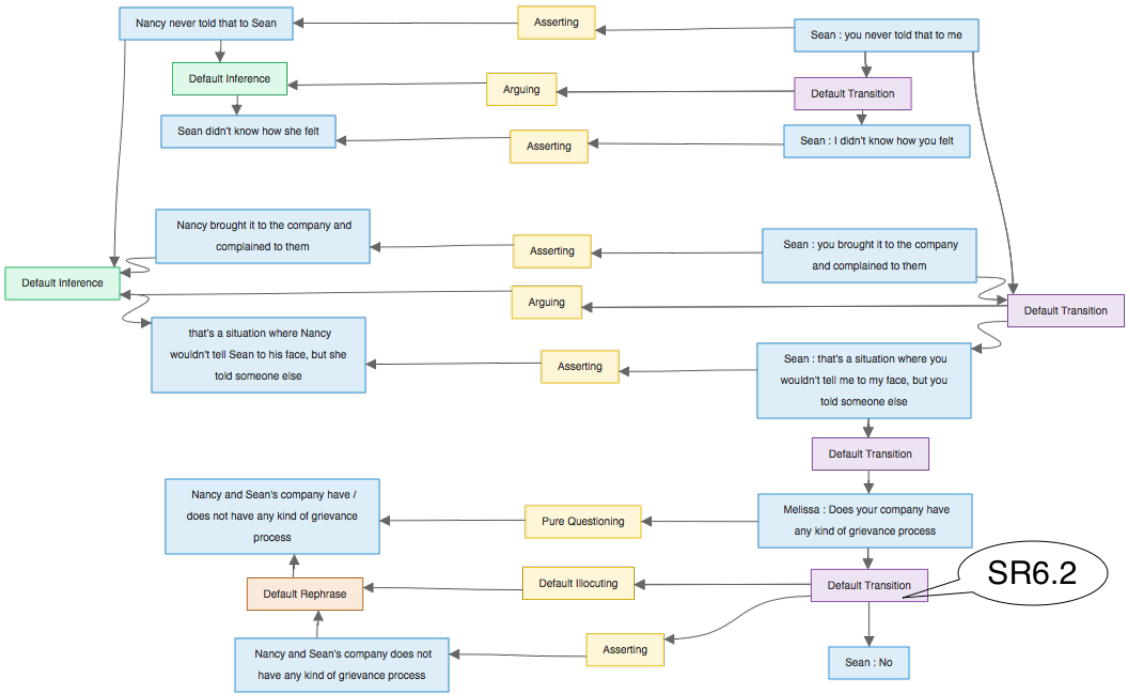

Figure 6.12: Analysis of Example 18, end of turn 18b to turn 18d - Argument map # 10792

The rest of the analysis (Figure 6.12) shows that Sean then argues two other times: he did not know how she felt because she did not tell him, and given that she did not tell him and but told the company supports Sean's proposition that she would not tell to his face something she did tell to someone else. The analysis also shows that after Sean's

arguments, the mediator (Melissa) asks, via a pure-question, whether their company has a grievance process, which Sean answers negatively: they do not.

In this example again, the first rule of MDG is not respected: Sean performs several moves at a time. Moreover, he disagrees with the other party, and argues without having been challenged by a mediator. What is more, no rule has been defined to allow reported speech in MDG. Finally, the mediator asks a pure-question after a party asserted something; although this is allowed by SR5.1, the content of the proposition and the addressee are not what the rule tried to capture (indeed, SR5.1 stipulates that after P_x performed A(p), M can perform PQ(p) addressed at P_y). Therefore, the beginning of this dialogue does not match any of our MDG rules. The last two turns however, are captured by SR6, which mentions that when M asks a PQ about p, a party can answer p (SR6.1) or $\neg p$ (SR6.2).

The following dialogue comes from the same mock-mediation. It marks the end of the mediation: disputants found a solution to their problems at work, and are now discussing where they should meet if new issues arise when they are at work.

(19) a. Sean McNeil: *Perhaps we could meet in the Personnel Office, where there aren't prying ears.*

b. Melissa Myer: *Sure. Does that sound okay with you?*

c. Nancy Butler: *I don't want people gossiping about you and I meeting in the Personnel Office.*

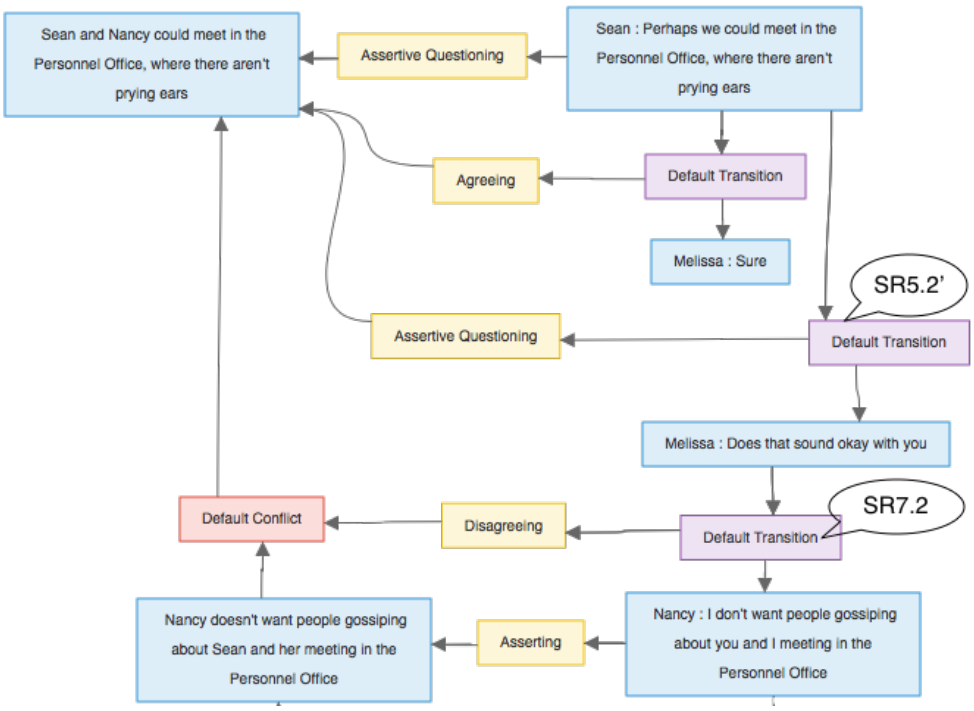

Figure 6.13: Analysis of Example 19 - Argument map # 10801

The analysis shows that in the first turn, Sean is assertive-questioning Nancy. The mediator then agrees and asks Nancy the same question but she disagrees.

MDG does not allow parties to assertive-question. Neither does it allow either M to agree with disputants since the mediator is supposed to be neutral. M can assertive-question P_y about p after P_x asserted P; here Sean did not assert p, however, as has been shown in Chapter 3, assertive-questions can be compared with Assertions because the speaker is committed to the propositional content of her question. That is why the dynamic between Sean's question, which is assertive, and Melissa's, which has the same propositional content can be compared with the rule SR5.2 in the game. SR5.2′ can fe defined as follows:

SR5.2′	M can perform a move of the type AQ(p) addressed to P_y if P_x has previously performed A(p) or AQ(p)

When Nancy answers the mediator's AQ, she is following the same rule as rule SR7.2 of MDG because she disagrees. This dialogue, and all the ones presented in the current section, therefore show that MDG rules are not capturing many behaviours which happen in mediation discourse.

The following section will provide a summary of the rules found in the two transcripts, the ones which have not been found, and the ones which were not present but the dynamic of which has been recognised under different forms. This will help verify that MDG reasonably well matches the reality of mediation dialogues.

6.2 Results of the evaluation process

The dialogue excerpts presented in the section above have shown that MDG constrains dialogical and argumentative behaviours which occur in mediation sessions, but other dynamics found in the same examples have not been captured by the rules defined for the game. Let's first summarise the dynamics identified in the excerpts which exactly or closely match MDG structural rules, and then identify the ones which do not correspond with any rules in order to evaluate how well MDG captures the dialogical and argumentative characteristics of mediation.

6.2.1 MDG structural rules vs mediation dialogues dynamics

Table 6.1 summarises the MDG structural rules which have been identified in the excerpts presented in Section 6.1. SR1 and SR2 being two very general rules which constrain the number of moves that players can make, they are not taken into account here.

Table 6.1: MDG structural rules identified in mediation dialogues

MDG structural rules	Exact match in	Close match in
SR3.1	Figure 6.1	Figure 6.1
SR3.2	Figure 6.2	Figure 6.2
SR3.3	Figure 6.3	
SR3.4	Figure 6.3	
SR4.1		
SR4.2		Figure 6.2
SR4.3		
SR4.4		Figure 6.3
SR5.1	Figure 6.4	
SR5.2		Figure 6.13
SR5.3	Figure 6.5	
SR6.1	Figure 6.4	
SR6.2	Figure 6.12	
SR7.1	Figure 6.6 Figure 6.8 Figure 6.9	
SR7.2	Figure 6.10 Figure 6.13	
SR8.1	Figure 6.5	
SR8.2		
SR9.1		
SR9.2		
SR9.3		
SR10.1	Figure 6.9	
SR10.2	Figure 6.9	
SR11.1	Figure 6.10	
SR11.2		Figure 6.8
SR12.1		Figure 6.8
SR12.2		

We can see that the vast majority of MDG rules are indeed found in natural language in mediation discourse. However, six out of the 26 rules have not been identified at all in the mediation dialogues studied in the previous section. The small sample of analysed examples does not allow concluding that the behaviours which the game tries to capture through these rules do not exist in mediation. It is however important to understand why these particular rules do not appear, whereas others appear in several excerpts.

The first rules which have not been found at all in the examples are rules SR4.1 and SR4.3 which stipulate that, at the beginning of the mediation dialogue, after the parties asserted two different propositions representing what they respectively consider as the main issue in their conflict, M has to pure-challenge the disputants in order to discover

what they ground these Assertions on. As we have seen, PChs are relatively rare in mediation dialogues, and other dialogical contexts in general. In Chapter 5, in which the rules of MDG have been presented, pure-challenging has been made available to M with the aim of sticking to dialectical games standards in which players argue whenever they are challenged. The small number of occurrences of PChs in the DMC explains not only the fact that rules 4.1 and 4.3 have not been identified in the few excerpts presented (see Chapter 4), but also the absence of another behaviour captured by rule 12.2. According to this rule, M can perform $PCh(\neg p)$ after a move of the type $R(\neg p)$; once again, it may be because Pure Challenges are not the only way to create arguments and rarely occur in the corpus.

The other dynamics which have not been found in the excerpts concern the illocutionary force of *withdrawing* and are the only rules including a move of the type $\mathrm{W}(p)$; these are SR8.2, SR9.1, SR9.2 and SR9.3. According to SR8.2, a party can withdraw p after having been challenged. Rule SR9.1 claims that after a party withdraws p, M can perform a move of the type $AQ(\neg p)$ to verify whether the party who is not committed to p (that is, who has retracted p) is then committed to $\neg p$. With SR9.2, M can pure-question a party after a move of the type $\mathrm{W}(p)$. Finally, rule SR9.3 constrains M to assertive-questioning a player about q after a move $W(p)$. The relatively small size of the corpus does not allow us to conclude that withdrawing is a locutionary act which does not exist in mediation, but no example can confirm that it does either. However, a few dialogical situations have been found in the corpus in which withdrawing is not explicitly marked (by the speakers' illocutionary forces for example) but which can be compared with MDG rules. Let's take again the two transcripts used for the evaluation process in Section 6.1 above, and analyse some excerpts in which speakers show, through different types of moves, that they are not committed to a proposition.

Example 20 is taken from the real mediation transcript. In this excerpt, one of the disputant explains that her co-worker made her feel as if she did not belong to the team.

(20) a. Lauren: *I felt pushed out the whole way [. . .]*

b. Mediator: *How?*

c. Alice: *How?*

d. Lauren: *Not from you but from Employer*

e. [. . .]

f. Mediator: *Do you think they feel threatened by you?*

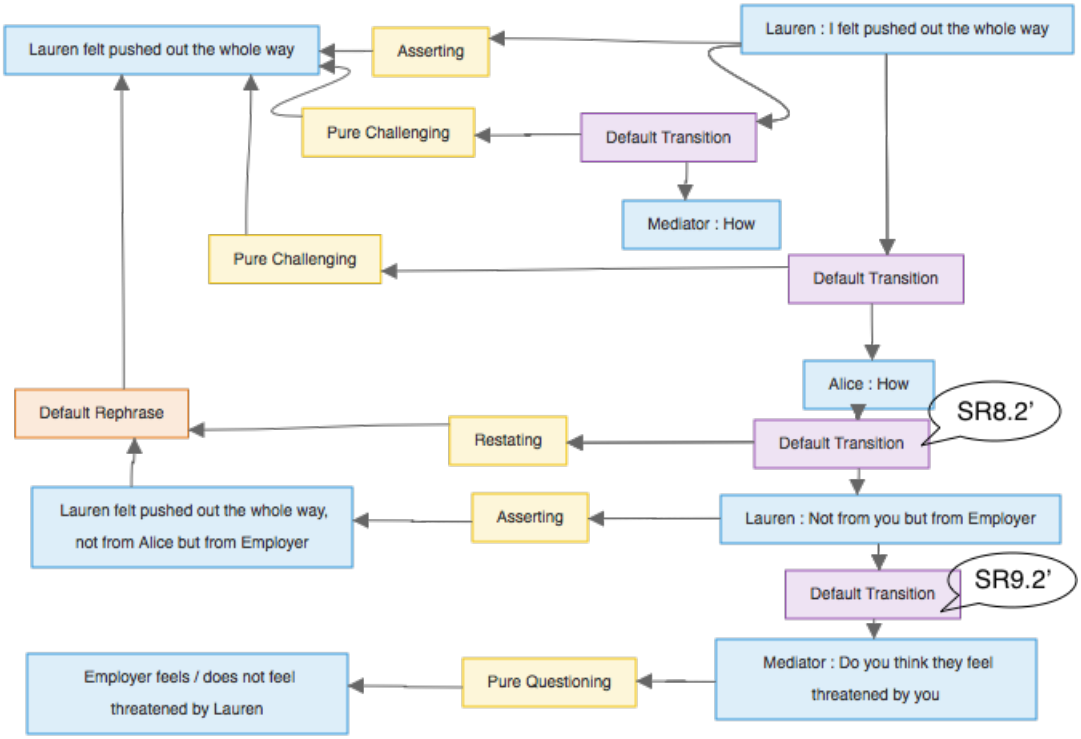

Figure 6.14: Analysis of Example 20 - Argument map # 10953

Figure 6.14 is the analysis of Example 20. After Lauren asserted a proposition, Mediator and Alice pure-challenge it. Instead of directly answering the challenge, Lauren restates her proposition. She thus provides a new proposition, showing that she is not committed to the challenged proposition, and does not have to justify her position on this one. Lauren has therefore retracted a proposition after Mediator has challenged her. The spirit of a withdrawal (i.e. someone showing that she is not committed to a proposition anymore) can be observed in this exchange when the party restates the challenged proposition: instead of answering the challenge and providing an argument supporting her proposition stipulating that she was "pushed out the whole way", she restates this proposition. It is not Alice who made her feel as if she did not belong to the team, but Employer. The proposition she asserted first is not actually accurate and she is rather committed to the second one. Consequently, this behaviour has been labelled SR8.2′ to show the close match with what SR8.2 stipulates. 8.2′ can hence be defined as follows:

8.2′	After M has performed PCh(p) to P_x, if P_x wants to withdraw p, he can R(r), where r must be a Rephrase of p

In the last turn, Mediator asks a Pure Question. The relationship between Mediator's last move and Lauren's Assertion at turn 20d is represented by SR9.2′, which shows that this dynamic is not exactly the same as the one defined in MDG rule SR9.2, but closely related. In the game, this rule indeed stipulates that right after a party withdraws a proposition, M can ask a Pure Question; here, the mediator asks the Pure Question after the party withdraws a proposition, even though the withdrawal happens in the form of a Rephrase. SR9.2′ can therefore be defined as follows:

9.2′	After P_x restated a proposition to withdraw it (see 8.2′), M can perform PQ(q) addressed either to P_x or P_y.

This example shows that when a party restates a proposition after a pure-challenge, it means that the party is not committed to the challenged proposition, but to a slightly *Rephrased* one (i.e. the restatement). Therefore, restating a proposition is similar to withdrawing one in order to provide a more accurate one, to which one can be held.

Let's take another example in which the speaker's behaviour is close to withdrawing a proposition. In Example 21, Mediator is asking both disputants whether the fact that Alice mentioned something to Katy's parents (they are her carers) because Lauren did not dare to, has created some tension between them.

(21) a. Mediator: *That didn't cause strife between the two of you at all?*

b. Alice: *No.*

c. Lauren: *But I did…I think, because Alice had spent the most time with the two of them together, she witnessed a lot more of it, whereas I was just passing on comments that Katy had made. So I think maybe Alice was thinking "Look, how can you not see this?"*

d. Alice: *Yeah, I was.*

e. Lauren: *Whereas I wasn't seeing it.*

f. Mediator: *Right. So it's a wee bit the other way around, that your impression of Lauren was perhaps a bit more negative?*

g. Alice: *Yeah. I couldn't understand why on the Thursday morning Lauren couldn't see that Katy's moods had…*

Let's analyse turns 21a, 21b, the end of turn 21c, turns 21d and 21f, and the beginning of turn 21g.

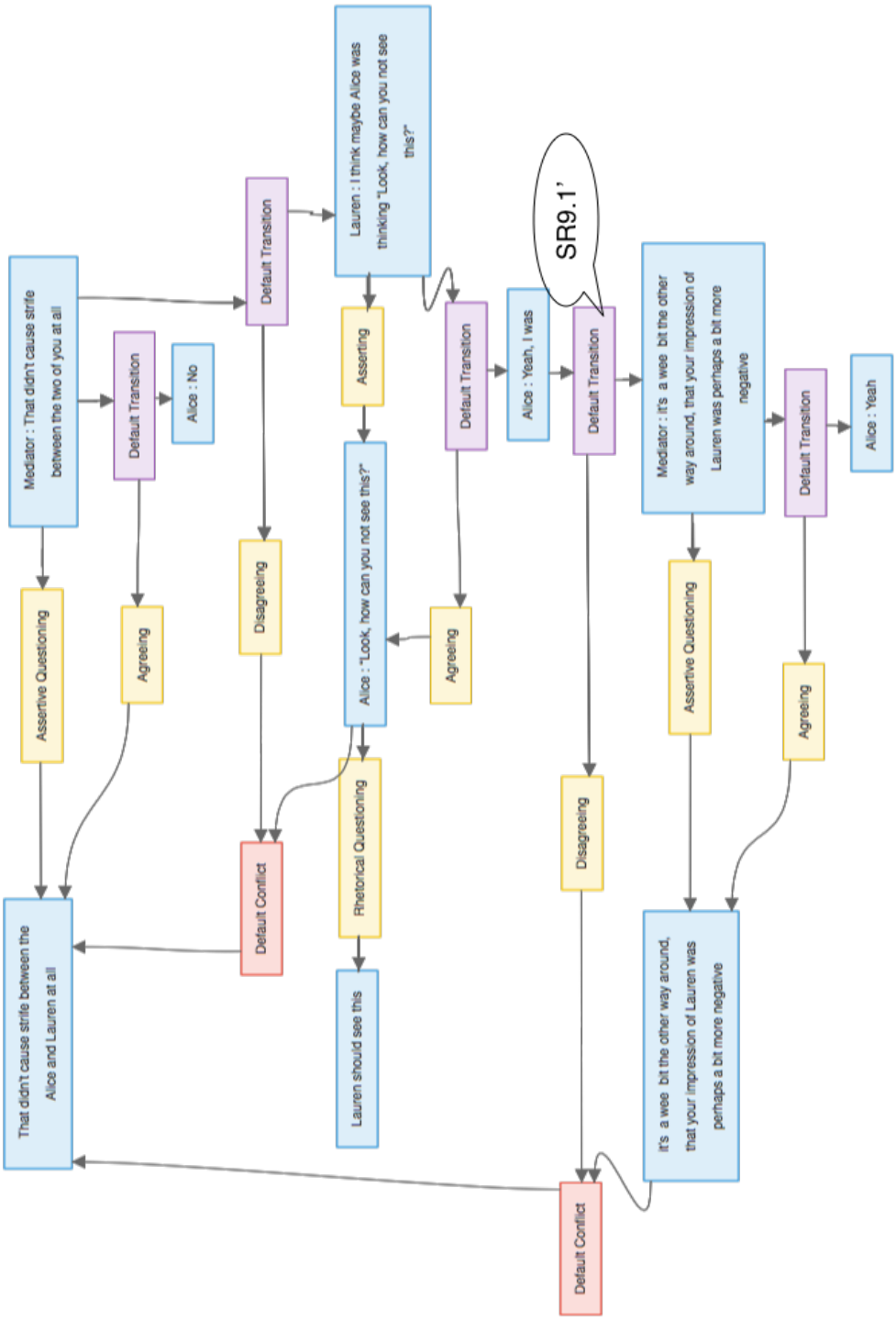

Figure 6.15: Analysis of turns 21a, 21b, the end of turn 21c, turns 21d and 21f, and the beginning of turn 21g - Argument map # 10954

The IAT analysis in Figure 6.15 shows that Mediator assertive-questions the parties: Alice agrees in the second turn, but Lauren disagrees. Her move is quite complex (dialogically, and argumentatively). She reports Alice's thoughts; this is analysed as reported speech: on the right hand side is her locution, in the middle Alice's 'thought' (considered as a locution) appears, and the left hand-side box contains the proposition of Alice's (supposed) thought/locution. Lauren is asserting that Alice thought that Lauren should have seen what was going on between Katy and Jake[1]. Now, if we examine the relationship between Lauren's move and the previous ones, we can understand that, by reporting Alice's thought, – that we will refer to as a locution – Lauren is building a counter-argument: the reported-locution allows her to disagree with Mediator's question: it *did* cause strife between them because Alice said (thought) that she should have seen the relationship between Katy and Jake. At turn 21d, Alice responds to Lauren by agreeing: she *did* think that Lauren should have seen it. The Mediator then asks Alice a question: if she thought so, it means that it *did* cause strife between them, which is in conflict with the proposition of his first question, with which Alice had agreed. The mediator has therefore highlighted a contradiction in Alice's speech: she first said that the fact that Lauren went to talk to Katy's parents did not cause tension between them but she also agreed that she had a bad impression on Lauren. Through his question, Mediator tries to emphasise this contradiction in her commitments: she cannot say that it did not cause strife between them, and then say that she had a bad impression about Lauren. The fact that she agrees with Mediator's pure-question makes it more obvious that she is not totally committed to "that did not cause strife between" them. This is comparable to rule SR9.1 which stipulates that after a party withdrew a proposition p, M can ask an Assertive Question to check whether the party is then committed to the opposite proposition $\neg p$. The relationship between Alice and Mediator's moves at turns 21d and 21f is therefore close to SR9.1 and is signalled with $'$ in the Figure. 9.1$'$ would be defined as:

9.1$'$	After P_x withdrew a proposition p, or committed to two opposite propositions p and $\neg p$, M can perform AQ($\neg p$) addressed to P_x.

To sum up, a small number of rules have not been identified in DMC. Yet, Examples

[1]Given that this is only a thought, it is as if Alice was only wondering; therefore rhetorical-questioning is used to represent the illocutionary force.

20 and 21 contain three dynamics which do not exactly match MDG rules but capture the essence of SR8.2, SR9.1 and SR9.2. No dynamic, however, has been identified in the two transcripts which could be related to SR9.3. This structural rule allows M to assertive-question P_x or P_y after P_x withdrew a proposition. Through assertive-questioning, as we have seen in Chapters 3 and 4, speakers either seek for the hearers' (dis-)agreement, or assert (subtly, thanks to the interrogative form) their own opinion. Mediators being neutral, assertive-questioning usually allow them to verify whether parties agree with each other, and they will prefer using pure-questions to tackle new issues in order to preserve their neutrality. Section 6.2.2 below proposes to revise MDG rules so that the game can take into account the dynamics identified above.

6.2.2 Revision of MDG rules

In Section 6.1, seven dynamics have been detected in mediation dialogues which are close to MDG rules, and in Section 6.2.1, other dynamics have been identified which also capture the essence of three of MDG structural rules. Each of these ten dialogical behaviours have therefore been redefined to take into account the slight discrepancies with the original rules if the game. Let's summarise them in Table 6.2 and 6.3 below.

Table 6.2: Dynamics closely matching MDG rules - part 1

Rule	Definition	Corresponding rule in MDG	Definition
SR3.1′	M moves first with either one or several moves of the type PQ(t) addressed to P_1	SR3.1	M moves first with PQ(t) addressed to P_1
SR3.2′	P_1 must answer with several moves of the type A(p) iff M has performed several moves of the type PQ(t)	SR3.2	P_1 must answer with A(p)
SR4.2′	P_1 can A(r) after A(p) providing that A(r) represents a premise for A(p)	SR4.2	P_1 must answer with A(r)
SR4.4′	P_2 can A(s) after A(q) providing that A(s) represents a premise for A(q)	SR4.4	P_2 must answer with A(s)
SR5.2′	M can AQ(p) addressed to P_y if P_x has previously performed A(p) or AQ(p)	SR5.2	After P_x performed A(p), M can AQ(p) addressed at P_y

The dynamic 3.1′ corresponds with SR3.1 in MDG; the difference is that, in MDG, M's first move must consist of one, and only one Pure Question, whereas in the analysed dialogue, the mediator asks two Pure Questions. To reflect this in the game, structural rules must be changed in order to allow M to ask each of the parties several Pure Questions in the beginning of the dialogue. 3.2′ – which captures the parties' reaction to 3.1′ – allows P_x to perform several Assertions in a row if M has asked more than one Pure Question at the beginning of the dialogue. Structural rules must also be changed to allow both parties to perform several Assertions if M has asked several Pure Questions.

4.2′ and 4.4′ are two similar rules since they capture the same dynamic but are respectively designed for the two different parties. These dynamics can be compared with SR4.2 and SR4.4 respectively, the only difference being that, in the game, parties must wait to be challenged before they can argue, whereas in the mediation dialogue, the disputants argued without being asked to. Rules 4.2 and 4.4 can be revised to allow parties to argue

without being challenged. This more closely matches the reality of dialogues in general: speakers usually do not wait to be challenged to provide arguments (see the occurrences of Challenges compared to the occurrences of Assertions in MM2012c[2] and the DMC[3]).

The difference between the rules of the game 5.2 and the dynamic 5.2′ is that, in the analysis of mediation dialogue, a disputant asked an Assertive Question and the mediator asked the other disputant if she agreed whereas, in the game, although M can ask a party whether she agrees with her opponent, parties cannot assertive-question. This constraint has been put on players to only allow M to deploy strategic moves. Assertive Questions, as we have seen in Chapter 3 are a useful way to trigger an opponent's agreement; in mediation, if a disputant asks his opponent an Assertive Question, he may be able to easily find consensus. Adding 5.2′ will require changing locution rules to allow parties to assertive-question their co-disputant and structural rules so that this move can occur after a party made an Assertion and wants to trigger his opponent's agreement.

[2]Table 3.3
[3]Table 4.1

Table 6.3: Dynamics closely matching MDG rules - part 2

Rule	Definition	Corresponding rule in MDG	Definition
SR8.2′	After M has performed PCh(p) to P_x, if P_x wants to withdraw p, he can R(r), where r must be a Rephrase of p	SR8.2	After M performed PCh(p) to P_x, P_x can W(p)
SR9.1′	After P_x withdrew a proposition p, or committed to two opposite propositions p and $\neg p$, M can perform AQ($\neg p$) addressed to P_x	SR9.1	After P_x performed W(p), M can AQ($\neg p$) addressed to P_x
SR9.2′	After P_x restated a proposition to withdraw it, M can PQ(q) addressed either to P_x or P_y.	SR9.2	After P_x performed W(p), M can PQ(q) addressed either to P_x or P_y
SR11.2′	M can R($\neg p$) after P_x has performed several moves after A($\neg p$)	SR11.2	After P_x performed Disagr(p), M can R($\neg p$) addressed to P_x and P_y
SR12.1′	M can AQ($\neg q$) after R($\neg p$) iff $\neg q$ is a Rephrase of $\neg p$	SR12.1	After M performed R($\neg p$), M can AQ($\neg p$) addressed to P_x i.e. the player who previously disagreed on p

8.2′ and SR8.2 correspond with dynamics through which parties show that they are not committed to a proposition anymore. In MDG, a party can withdraw a proposition via a move withdrawing, while in the dialogue analysed, the non-commitment which has been detected happened with a different type of move: the party asserts a proposition which is a Rephrase of the proposition he wants to retract. It is possible to change MDG locution rules to allow parties to restate whenever they want to withdraw a proposition. Structural rules would need to be changed as well to reflect this dynamic. Moreover, allowing moves of the type R(p) to a greater number of players, and not just to M, would match with the findings in Chapter 4, in which it has been shown that restating is a very frequent illocutionary force in mediation. 9.2′ works together with 8.2′: it is one of the possible reaction of M after a party has shown that he is not committed to a proposition earlier uttered. 9.2′ differs from SR9.2 because the retraction of the proposition is done via a Restating move, and not a Withdrawing move as stipulated in MDG. If 8.2′ is added to MDG rules, 9.2′ must be added as well.

In MDG, SR9.1 stipulates that after P_x performed W(p), M can AQ($\neg p$) addressed to P_x. In Example 21, we have seen that a party retracted a proposition, not via a withdrawing move, but by asserting the opposite propositions. This other way of showing that one is not committed to a proposition must be accounted for in the game, and rules allowing M to AQ($\neg p$), whenever he detects that a party asserted two opposite propositions, must be added to the game's structural rules.

11.2′ differs from SR11.2 because the disputant has asserted several propositions in the dialogue, while MDG forbids parties to perform several moves. Allowing parties to perform several moves in a row, will more accurately reflect data from MM2012c and the DMC: speakers argue without being challenged. Consequently, 11.2′ must be added to MDG.

12.1′ differs from SR12.1 as the mediator, after he has restated a proposition, can ask an Assertive Question which has a different propositional content; but this propositional content itself must be a Rephrase of the restated proposition. Restating, as we have seen in Chapter 4, is a very common illocutionary force in mediation. Furthermore, the dialogue in which 12.1′ has been identified (see Example 15 above) shows that restating

does not merely means repeating (as SR12.1 tried to capture) but can be about *reframing*. In the dialogue analysed, through dynamic 12.1′, the mediator has sought to trigger the disputant's agreement more subtly than by just repeating or paraphrasing the content under the form of a question; rather, she has totally changed the propositional content. Restating the proposition uttered by the party who disagreed (captured by SR11.2) is a simple repetition, but restating the restatement – i.e. rephrasing what one restated (12.1′) – is a reframing which has allowed the mediator to trigger the disputant's agreement on a proposition he never uttered. Thanks to this strategy, the mediator has brought quite a new proposition, although it looks as if it is naturally coming from what the disputant said.

The 10 dynamics identified with the symbol ′ more accurately reflect the reality of mediation dialogues and can be included in the game to deliver a more realistic dialogue game. MDG rules are revised below and an improved new version of the game, MDG′, is proposed.

MDG′ locution rules Withdrawing has not been found at all in any of the analysed dialogues; although a Withdrawing move seems reasonable on theoretical grounds to allow players to retract a proposition – for instance in such games as Walton's CB (Walton, 1984) – there is no evidence that such a move may exist in mediation dialogues. We have seen that parties retract propositions by asserting opposite propositions. As a consequence, in the game P_x can assert $\neg p$ if, and only if, he asserted p in the first place to show that he is not committed to p anymore. We have also seen that all the dynamics identified as 8.2′, 9.1′, 9.2′ concern Restating, an illocutionary force which, unlike Withdrawing, appears several times in mediation dialogues when disputants want to retract a proposition. A new locution rule which allows parties to restate a proposition to retract another one is therefore needed in the new version of MDG. As a consequence, the locution rules of MDG′ must be changed to remove Withdrawing from the possible moves and replace it with Restating and allow parties to assert opposite propositions. Moreover, we have seen that parties assertive-question each other to find consensus: a move allowing P_x to assertive-question his opponent must also be added. Table 6.4 presents the new locution rules for MDG′.

Table 6.4: MDG new locution rules

LR1′	M can only question (Q), challenge (Ch) or restate (R): 1. PQ(p) when he asks whether p is the case, i.e. if P_x believes p 2. AQ(p) when he seeks P_x's agreement on p 3. PCh(p) when he seeks P_x's ground for stating p 4. R(p) when he reuses P_x's proposition p
LR2′	P_x can only: 1. A(p) when he states an opinion **2. A($\neg p$) in order to retract p (iff he was the one who uttered p in the first place)** 3. **R(q) when he restates p in order to retract p** 4. Agr(p) when he agrees on p 5. Disagr(p) when he disagrees on p **6. AQ(p) when he seeks P_y's agreement on p**

MDG′ locution rules consist of three new rules: LR2.2′ now allows parties to assert opposite propositions, LR2.3′ now allows parties to restate propositions in order to retract a previously uttered one which they do not want to be held to anymore, and LR2.6′ allows them to assertive-question their opponent.

MDG′ commitment rules New locutions rules having been defined for MDG′, the commitment rules of the game must be revised as well to reflect the changes on the parties' commitment stores when they perform locutions of the type A($\neg p$), R(q) and AQ(p).

Table 6.5: MDG new commitment rules

CR1′	After A(p), performed by P_x, p is added to Com_x
CR2′	**After A($\neg p$), performed by P_x, $\neg p$ is added to Com_x**
CR3′	**After R(q), performed by P_x, q is added and p removed from Com_x where q must be a Rephrase of p**
CR4′	After Agr(p), performed by P_x, p is added to Com_x
CR5′	After Disagr(p), performed by P_x, $\neg p$ is added to Com_x
CR6′	**After AQ(p), performed by P_x, p is added to Com_x**

With LR2.2′, parties can retract propositions: if P_x asserts p and $\neg p$ in the same conversation, p is removed from his commitment stores and is replaced by $\neg p$. Also, with the new locution rule LR2.3′ (i.e. the retraction of a proposition does not happen with W(p) but with R(q)), the effect on the commitment stores of a move R(q), where q must be a Rephrase of p is as follows (rule CR3′): p is removed (this is the proposition which is retracted) and q is added (since it is the proposition to which the player wants to be held). Finally, with LR6′, if a party assertive-questions another party, the proposition must be

added to his commitment store (remember that Assertive Questions have an assertive force: speakers are committed to the proposition of the question); this is stipulated by CR6′.

MDG′ structural rules MDG structural rules too need to be modified to take into account the four dynamics identified in the mediation dialogues but which were not captured by the original rules, as well as the dynamics which used to include a Withdrawing move, and which are now replaced by Restating. Let's report MDG′ structural rules in Tables 6.6 and 6.7.

Table 6.6: MDG new structural rules - Part 1

SR1′	P_1 and P_2 can perform several moves per turn if: **1.** One of their propositions supports the other **2.** they answer to several questions
SR2′	M can perform several moves per turn if the first move: **1.** is a PQ, or 2. consists of restating (R)
SR3′	The dialogue starts with M seeking P_1 and P_2's respective points of view regarding t, therefore: **1.** M moves first with one or more moves of the type PQ(t) addressed to P_1 **2.** After that, P_1 must answer with one or more moves of the type A(p) iff M asked several PQ(t) **3.** Then, M moves with one or more moves of the type PQ(t) addressed to P_2 **4.** Next, P_2 must answer with one or more moves of the type A(q) iff M asked several PQ(t)
SR4′	The second step of the opening stage is to discover P_1 and P_2's grounds for p and q, therefore: **1.** M performs PCh(p) addressed to P_1 **2.** After that, P_1 must answer with A(r), where r is a support for p **3.** Then, M performs PCh(q) addressed to P_2 **4.** Next, P_2 must answer with A(s), where s is a support for q
SR5′	After P_x has performed A(p) 1. M can perform PQ(p) addressed at P_y **2.** P_x can perform AQ(p) addressed at P_y 3. M can perform AQ(p) addressed at P_y 4. M can perform PCh(p) addressed at P_x
SR6′	After M has performed PQ(p) addressed at P_x, P_x can perform: **1.** A(p), or A(p) *and* A(v), iff v support p 2. A($\neg p$) or A($\neg p$) *and* A(v), iff v support $\neg p$
SR7′	After M has performed AQ(p) addressed at P_x, P_x can: 1. Agr(p) 2. Disagr(p)

Table 6.7: MDG new structural rules - Part 2

SR8′	After M has performed PCh(p) to P_x, P_x can: **1.** A(q), or A(q) *and* A(v) iff v supports q **2.** R(q) iff q is a Rephrase of p
SR9′	After P_x has retracted a proposition (i.e. **R(p) or A(p) and A($\neg p$) in the same discussion**), M can: 1. AQ($\neg p$) addressed to P_x 2. PQ(q) addressed either to P_x or P_y 3. AQ(q) addressed either to P_x or P_y
SR10′	After P_x has performed Agr(p), M can: 1. PQ(q) addressed either to P_x or P_y 2. AQ(q) addressed either to P_x or P_y
SR11′	After P_x has performed Disagr(p), 1. M can PQ(q) addressed to any player **2.** P_x can performed A(q), iff q supports p 3. M can R($\neg p$) addressed to P_x and P_y
SR12′	After M has performed R($\neg p$), M must either: **1.** AQ($\neg p$) or AQ($\neg q$), iff $\neg q$ is a Rephrase of $\neg p$, addressed to P_x i.e. the player who previously disagreed on p, or 2. PCh($\neg p$) addressed to P_x i.e. the player who previously disagreed on p
SR13′	After P_x has performed AQ(p), P_y must either **1.** Agr(p), or **2.** Disagr(p)

MDG′ has 20 structural rules which are different from MDG original rules. SR1′ now allows parties to perform several moves in a row: SR1.1′ if they assert two propositions, one of which supports the other, or SR1.2′ if M has asked several Pure Questions at the beginning of the game (see SR2.1′). SR2.1′ now allows, M to perform several Pure Questions at the beginning of the game. The revisions of SR3′ are a consequence of both SR1.2′ and SR2.1′: if M asks several Pure Questions, then parties must answer all the questions. SR4′ is a consequence of SR3′: if M asked several questions, and parties answered them, M can Challenge any of their propositions; in addition, parties can assert two propositions as answers to M's Pure Challenges, provided that the second Assertion supports the first one.

With SR5.2′, parties can now assertive-question each other to verify whether their opponent agrees with them (note that the analysed dialogue in which this dynamic has been detected, M asked the same Assertive Question as the party; this is not added to the game because rules force parties to answer right after an Assertive Question: if P_x assertive-questions P_y, P_y will answer and M does not need to repeat the question). A

consequence of this new rule is rule SR13′, which provides the possible answer to P_x's Assertive Question: P_y either Agrees (SR13.1′) or Disagrees (SR13.2′).

SR6′ is a direct consequence of SR1.1′: parties must answer Pure Questions and can now support their answer with another Assertion supporting their response without being challenged. Similarly, if a party is challenged, he can provide further support to his answer with another Assertion (SR8.1′).

SR8.2′ is a consequence of LR2.3′: parties are allowed to restate propositions with the view to retract another proposition. With this structural rule, a party restates the propositional content of the Challenge to provide a new proposition which more accurately represents her belief: the challenged proposition is removed from her commitment store and replaced by the one coming from the restatement (see CR3′). In other words, SR8.2′ now allows P_x to restate a proposition in order to retract the challenged one.

SR9′ provides the possible reactions to the retraction of a claim: if P_x restated a proposition (SR8.2′) or asserted p and $\neg p$ in the same discussion, M can verify whether she is definitely committed to the opposite proposition (SR9.1′) or he can Pure Question or Assertive Question either parties to redirect the discussion. In other words, SR9′ is equivalent to SR9 in MDG, the only difference being that SR9.1′ to SR9.3′ can happen if P_x has (i) explicitly retracted a proposition via a move Restating (SR8.2′), or (ii) retracted p less explicitly via the Assertion of $\neg p$ which is in conflict with his previous Assertion p.

SR11.2′ is a consequence of SR1.1′: if a party disagrees on a proposition, he can directly provide supports to his answer by asserting a proposition.

Finally, SR12.1′ now allows M to AQ($\neg q$) after Restating p only if $\neg q$ and $\neg p$ are similar propositional contents i.e. $\neg q$ is a Rephrase of $\neg p$.

MDG rules have been revised on the basis of the data analysed during the evaluation process; MDG′ is a new game, the rules of which more accurately reflect dialogues in mediation.

MDG′'s Finite State Machine A DGDL specification for MDG was proposed in Chapter 5. The specification of the new version of the dialogue game, MDG′ has been revised accordingly. Rather than reporting it here, let's graphically represent the dynamics of the

game with a Finite State Machine (FSM). An FSM represents the different possible paths from a move to another. It is an abstract modelling of dialogue games. The path from a move to another depends on the the state of the dialogue and on the previous moves; the FSM therefore models the structural rules of a game by showing the different possible dynamics after each type of move. The FSM for MDG′ is given in Figure 6.16.

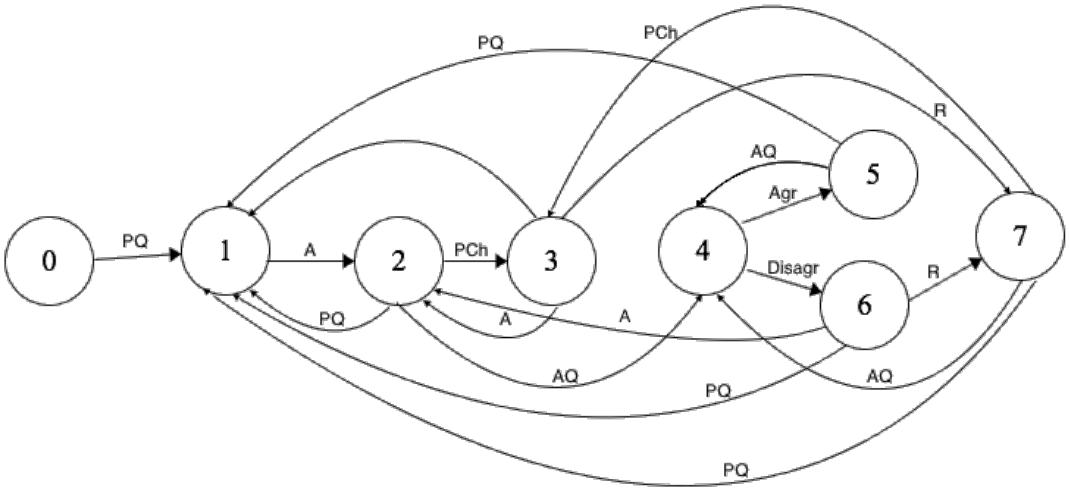

Figure 6.16: FSM for MDG'

In the FSM, moves are minimally specified: they are represented by directed arrows showing the illocutionary forces at stake after each step (symbolised by circled numbers). The players are not identified, nor are the propositional contents. For instance, the path from **1** to **2** represents SR3.2′ as well as SR6′; the path from **2** to **4** represents SR5.2′ as well as SR5.3′.

6.2.3 Mediation dialogues: remaining mismatches with MDG

During the evaluation process in Section 6.1, most of MDG rules have been identified in the two small corpora; and in Section 6.2.2 above some of the rules of MDG have been revised in order to make the game closer to what mediation dialogues look like. This has led to the definition of a new, more accurate game, MDG′. Yet, some dynamics in the analysed excerpts do not correspond with any of MDG rules, and have not been included in the revision of the game MDG′. These are visible in the figures in Section 6.1 through the transition nodes which have not been identified with one of the game rules, or through the identified illocutionary forces which do not match with locution rules. In the future, they should be taken into account to ensure an enhanced, more realistic mediation

dialogue game. These differences between MDG′ and real mediation dialogues therefore deserve a more detailed account in order to later implement discursive, argumentative and dialogical features which would further improve the game. Two categories of mismatches have been found. First, the dialogue type prevailing in the discussion; second, the use of reported speech. Although additional analyses must be carried out to capture their own characteristics in details, an overview of the challenges they represent and the possible ways of tackling them is proposed below.

Dialogue types in mediation In Chapter 5, Section 5.5, was mentioned the possibility of taking into account the different dialogue types identified by Jacobs and Aakhus (Jacobs and Aakhus, 2002b) in mediation discussions to capture the variety of dialogical dynamics. The analyses carried out in the previous section confirm that some dynamics are absent indeed from MDG but would be explained by the characteristics of therapeutic and bargaining discussions. Let's take one of the excerpts analysed in Section 6.1 and its IAT analysis below (Figure 6.17).

(22) a. Sean McNeil: *Perhaps we could meet in the Personnel Office, where there aren't prying ears.*

b. Melissa Myer: *Sure. Does that sound okay with you?*

c. Nancy Butler: *I don't want people gossiping about you and I meeting in the Personnel Office.*

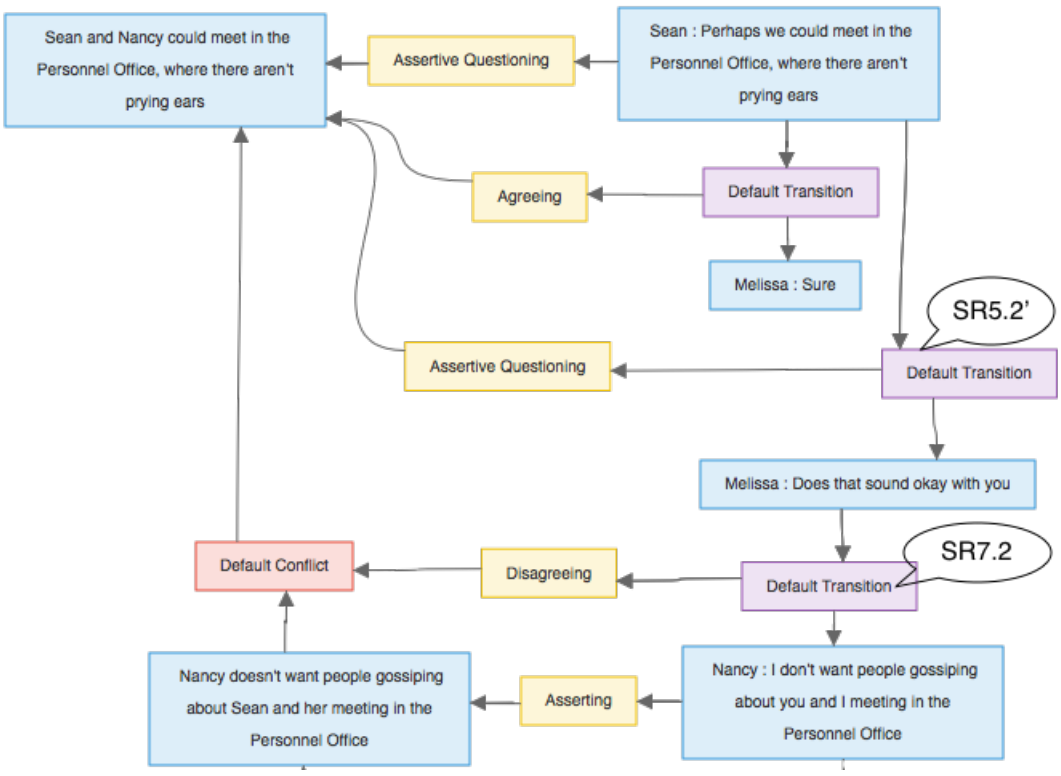

Figure 6.17: Analysis of Example 19

MDG′ allows parties to assertive-question each other in order to trigger agreement (which was not the case in MDG). Here, Sean asks an Assertive Question to Nancy who disagrees. Sean's move could be related to MDG′'s rule SR5.2′. If, however, we compare this dialogue, not with a critical discussion which MDG′ can be related to (see Section 5.5), but as a negotiation, then, Sean's question has another function than looking for consensus. In (Jacobs and Aakhus, 2002b), the bargaining type of dialogue in mediation has been defined as a discussion in which participants make offers and concessions, that is, they negotiate in order to maximise their gains and minimise their costs. In Section 5.5.2 of Chapter 5, we have seen the possible IAT elements which could be elicited in bargaining. Keeping these in mind, Example 22 could be differently analysed, as is shown in Figure 6.18.

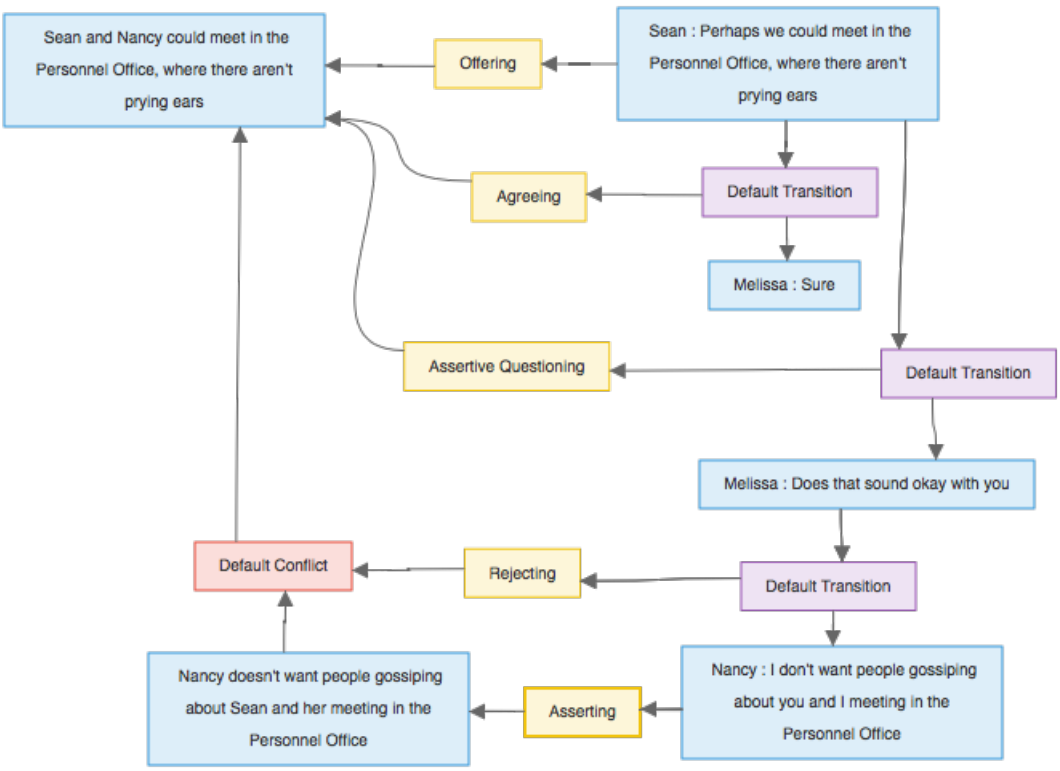

Figure 6.18: Analysis of Example 22

In Figure 6.18, illocutionary forces have been included to take into account the characteristics proper to bargaining dialogues in mediation. In this second version of analysis, Sean is not assertive-questioning but is offering: he makes a proposal which can be accepted or declined. His co-disputant, by asserting a proposition in conflict with his proposition, rejects the offer.

Let's take another example in which some dynamics contradict MDG′ rules:

(23) a. Melissa Myer: *So when Sean makes these jokes, you feel like you're being attacked in those jokes?*

b. Nancy Butler: *I do.*

c. Melissa Myer: *Okay, and feeling that way is valid because you're the one that feels that way.*

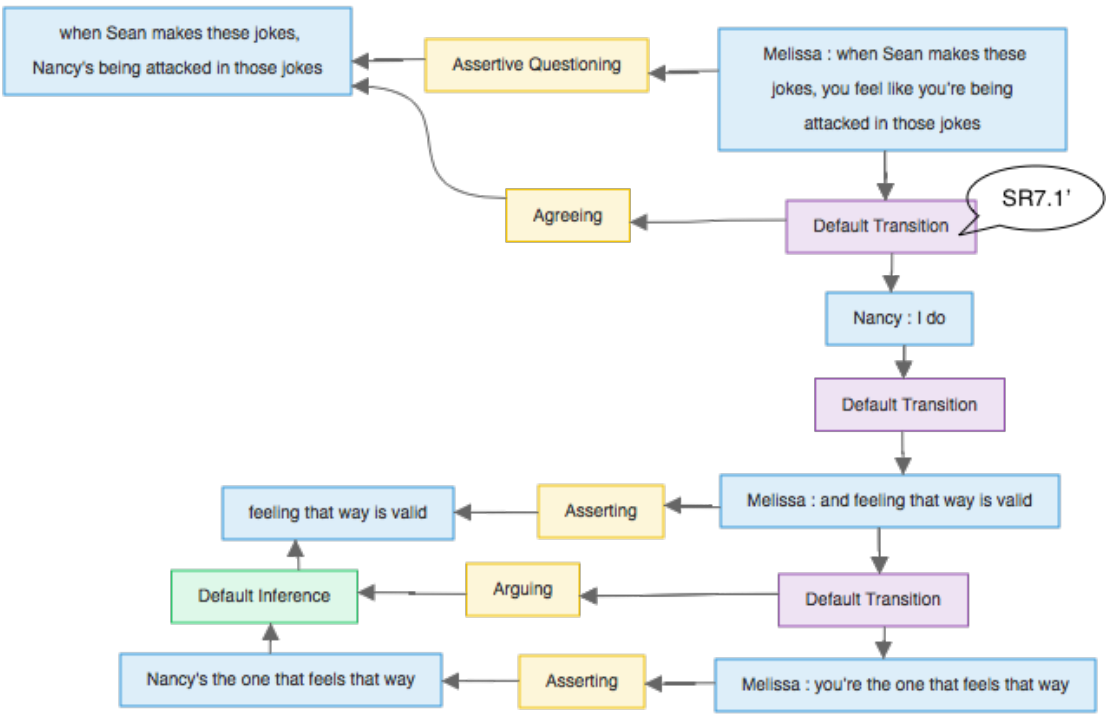

Figure 6.19: Analysis of Example 23

In the analysis of this example (Figure 6.19), we can see that the mediator is assertive-questioning a party who then agrees (SR7.1′), but what strikes is that the mediator is then arguing, which seems to go against mediation principle of neutrality. If we consider, again, that in mediation different types of dialogues can take place, the mediator's reaction may be more precisely explained. In therapeutic discussions, it has be shown indeed that feelings and emotions play a more determining role than facts and opinions, and mediators try to put them forward. Let's analyse this example with the illocutionary forces proposed in Chapter 5 to grasp the characteristics of therapeutic dialogues:

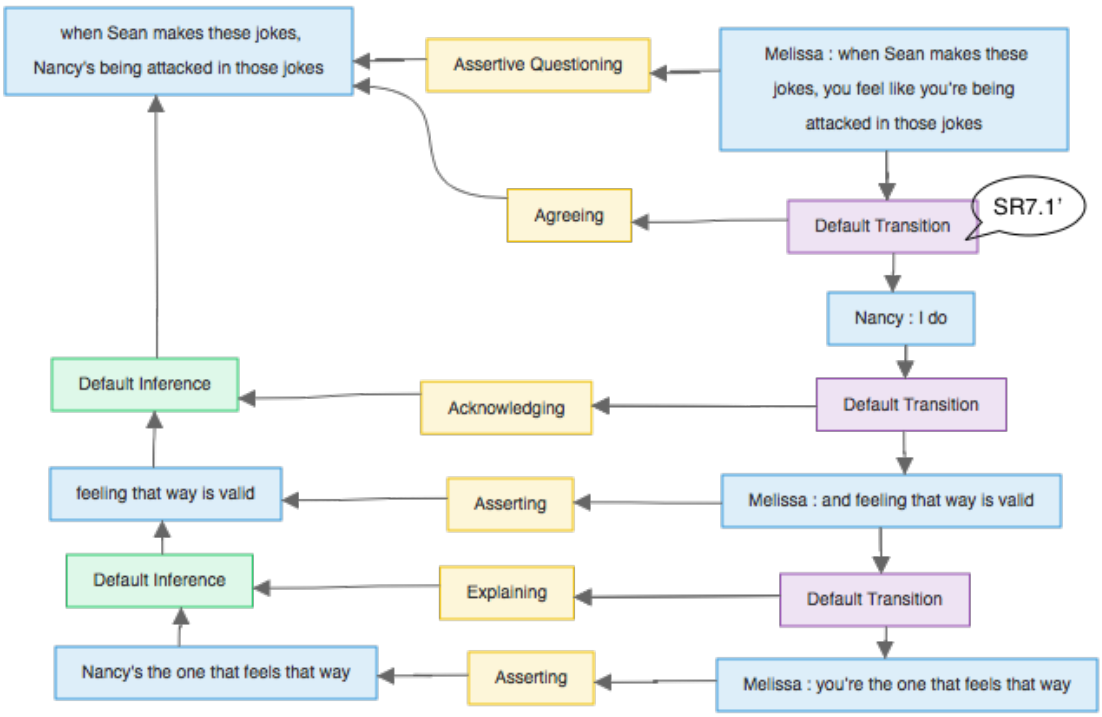

Figure 6.20: Analysis of Example 23 with other illocutionary forces

This new version shows that the mediator is acknowledging Nancy's feelings, and explaining why. She is not just arguing after Nancy agreed with her question as the first IAT analysis revealed.

These two examples show that some dialogical dynamics in mediation are not captured by MDG′ rules but could be modelled by taking into account the dialogue types. Proposing new locution rules according to moves proper to the types of dialogues, as seen in Chapter 5, Section 5.5, would allow delivering other dialogue games for mediation. This task will represent a major part in the future work on modelling mediation argumentative activity.

Reported speech *Reported speech* is another recurring dialogical behaviour which has been elicited in the excerpts above but which is not permitted in MDG′. Indeed, in many examples, speakers report their co-discussants', a third person's, or their own words. We have seen that these types of moves play a role in the argumentative activity: let's take again Example 12, turns 12c and 12g:

(24) a. Mediator: *What do we need to deal with and what do you hope to get from it?*

b. Alice: *Basically I want to try and get the erratic nature of the relationship out of the road because I just feel that, like I said to you before, I never know if I'm going to get something back that's negative or not quite-*

At turn 24b Alice says "like I said to you before…", which means that she is reporting her own words. The analysis has shown that this sentence plays an argumentative role in the dialogue; see the IAT analysis of these two turns (Figure 6.21).

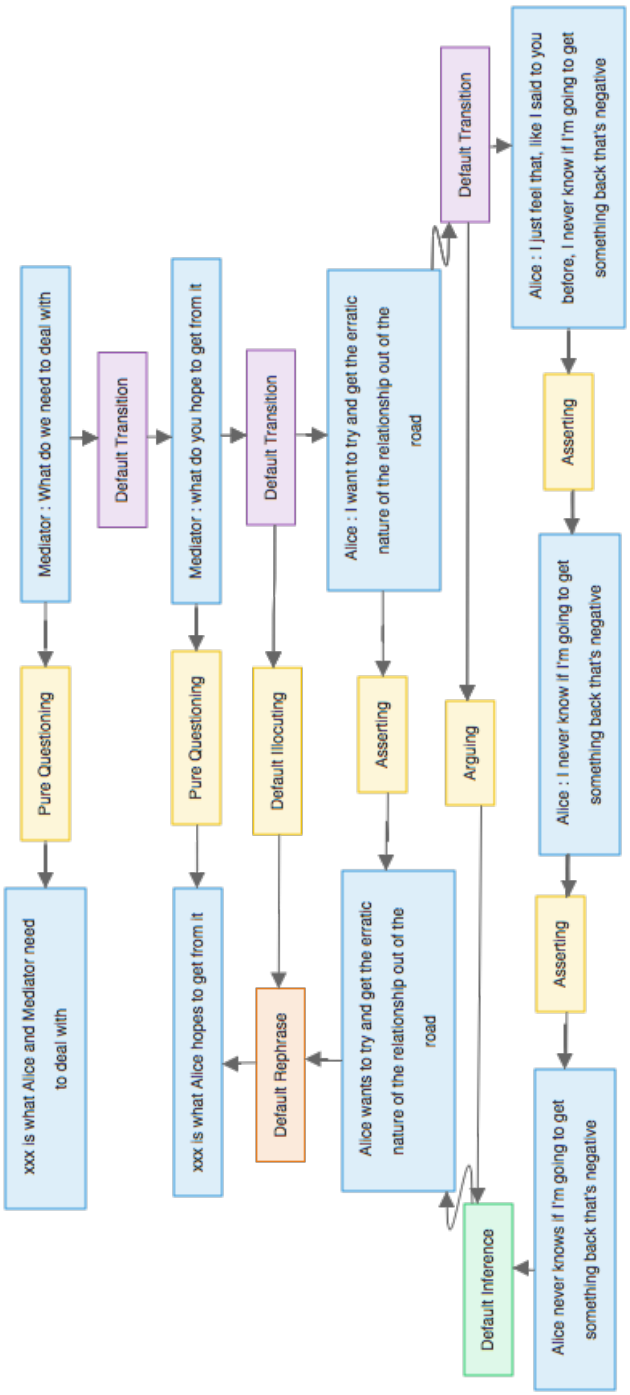

Figure 6.21: Analysis of Example 24

The analysis reveals that Alice is building an argument with her first proposition being the conclusion, and her second proposition (i.e. the propositional content of her reported locution) being the premise. This analysis therefore shows that the propositional content of a reported locution can be used as a premise to an argument.

The following moves (taken from Example 20 above) shows that the reported locution can also be used as a premise to an argument:

(25) a. Lauren: *I was kind of letting them know that I wasn't happy, and I felt as if maybe it was time to move on; and they've caught that straight away and every single supervision that I've had they've said "So, have you thought any more about moving on?"*

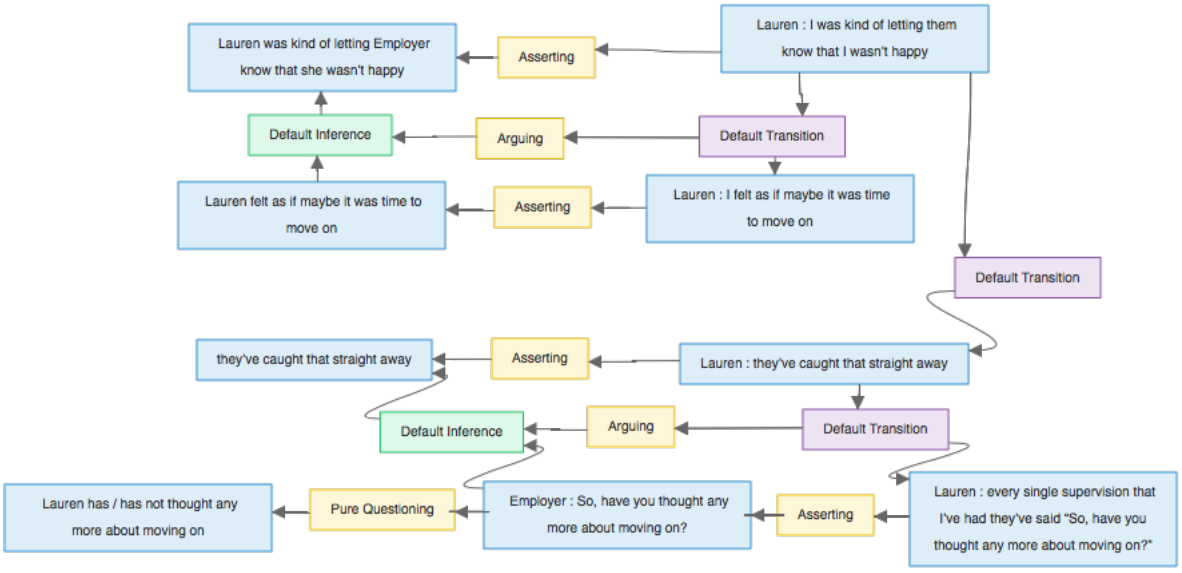

Figure 6.22: Analysis of Example 25

In this excerpt, the speaker is reporting someone's words (her employer's) and arguing as well; this time, however, the premise of her argument is not the propositional content of the reported locution: the reported locution itself supports Lauren's proposition that 'Employer caught that straight away'. This means that a fact does not play the role of a premise but a locutionary act in itself does. Lauren's argument is indeed: Employer caught that straight away because Employer asked the question "Have you thought anymore about moving on?".

Reported speech has been the focus of some discourse studies, very often related to the notion of meta-discourse (that is, discourse about discourse). Given the large number of reported locutions in the excerpts presented in this chapter, next chapter proposes a first step towards an account of this frequent dynamic. Some studies on the argumentative facet of mediation mention aspects of the argumentation which deal with the discourse itself rather than the dispute. For instance, (Greco Morasso, 2008, pp 258–274) highlights the role of some mediators' argumentative moves dealing with the communication on particular issues during the discussion; Jacobs (2002) identifies the techniques by which mediators preserve their neutrality notwithstanding their assertiveness, and insists on the mediators' task in giving a direction to the discussion. These studies, however, only focus on the subtle argumentative role of mediators. Chapter 7 below seeks to bridge a gap between studies on meta-discourse and knowledge in mediation discourse by extending the exploration of meta-communication to disputants and not just focusing on the mediators' tactics to manage discussions. More precisely, Chapter 7 will focus on typical linguistic devices of meta-discourse and will raise the question of the precise role and function of meta-discursive moves in mediation, and, by extension, in dialogical argumentation in general.

6.3 Summary of the evaluation process

In Section 6.1, real mediation dialogues have been contrasted with the Mediation Dialogue Game presented in Chapter 5 in order to verify that the dialogue game captures the majority and the most important dynamics of mediation exchanges. In Section 6.2.1, it has been shown that, during the evaluation process, (i) most of MDG rules are part of actual mediation dialogues, and (ii) some of the dialogical dynamics analysed, though not exactly matching MDG, are closely related to what the rules tried to model. As a consequence, MDG has been revised to take into account the actual dynamics in mediation. A set of new rules has therefore been defined in Section 6.2.2, leading to an improved version of MDG, called MDG$'$. The evaluation process has allowed discovering other differences between the Mediation Dialogue Game and real mediation dialogues. These discrepancies were visible through the transition nodes in the analyses which did not cor-

respond to any of the game's structural rules: it has been shown that, as part of future work, it will be necessary to explore in more details the three different dialogue types in mediation; also, the need to account for reported-speech has been highlighted, and a first theoretical exploration of this linguistic device – and meta-discourse in general – is therefore proposed in Chapter 7. These last two discrepancies are not crucial to deliver a dialogue game for mediation which matches the reality of mediation arguments; Section 6.4 therefore proposes to execute MDG′ to verify that it can be played by human players.

6.4 Implementation and product

The evaluation task has allowed refining the dialogue game for mediation; MDG′ includes rules which are precise enough to capture important and realistic dynamics. This task has ensured that the game is correctly modelled. It is now crucial to verify whether it is computationally usable so that real dialogues can be played. For this, MDG′ will be executed and played in Arvina.

6.4.1 Execution of dialogue games with DGEP and Arvina

The Dialogue Game Execution Platform (DGEP) was created to handle any DGDL specifications in order to implement a variety of systems (Bex et al., 2014), giving us the opportunity to automatically execute MDG′ in a system to play it. DGEP, through its link with the AIF, makes it possible to generate and retrieve dialogues in AIFdb (Bex et al., 2014). It is therefore possible to make use of the Argument Web resources (Lawrence et al., 2012b), the largest publicly available dataset of dialogical and non-dialogical arguments coming from texts analysed with different tools. In DGEP, AIFdb is used as a knowledge base to extract information but also to bring new data. That is, once implemented, a dialogue game relying on DGEP allows virtual agents to query the AIFdb resource to provide responses and supports for their viewpoints, and human users' arguments are, in turn, added to the database. Using DGEP for the implementation of MDG′ will therefore allow (i) virtual agents to take part in the game by providing arguments found in the DMC and (ii) users to add their own arguments.

Arvina is a dialogical support system for the execution of games (Snaith et al., 2010; Lawrence et al., 2012a) relying both on DGDL and DGEP. It allows users to play a dialogue game with virtual agents and or other humans on a user-friendly interface. Arvina is the first tool providing the opportunity for users to engage in an argumentative dialogue with human and virtual participants while offering a natural conversation style. The advantages of using Arvina in public deliberation contexts has been shown by Snaith et al. (2010), and additional dialogue games (e.g. for debates) have been implemented. This flexibility therefore ensures the possibility to execute MDG′, with the aim of assuring that MDG′ has been well modelled and correctly specified.

Figure 6.23 summarises the architecture underlying the processing and implementation of MDG′.

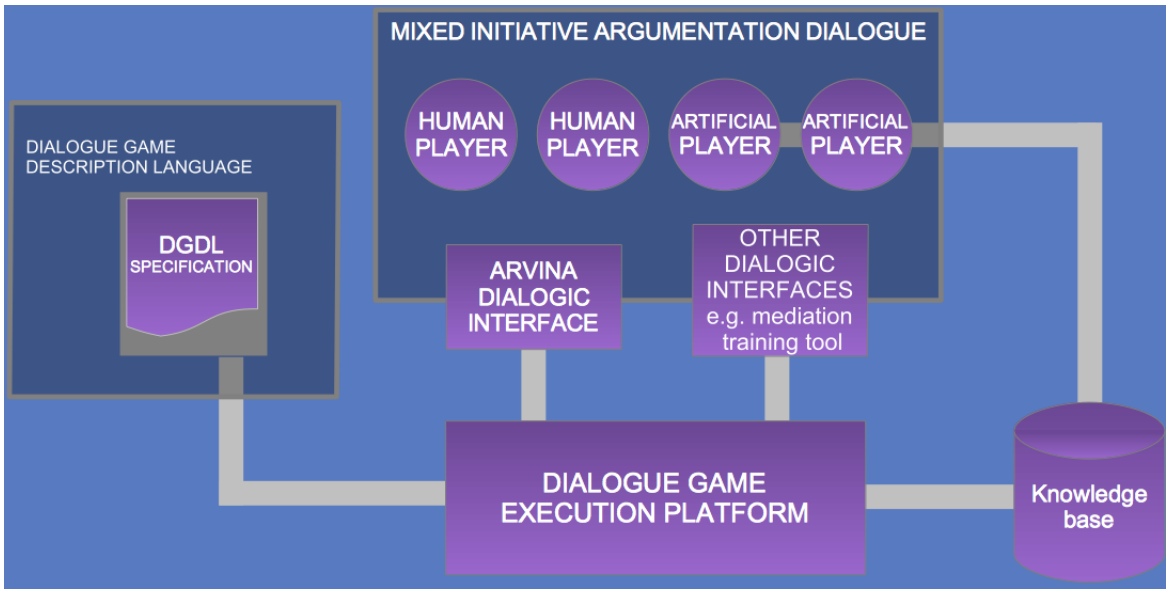

Figure 6.23: DGEP and support services for the execution of dialogue games

6.4.2 Execution of MDG' in Arvina

Let's take Example 26 below, a short example of dialogue in a mediation setting. This excerpt has been slightly simplified to fit the present aim. In the transcript, the mediation involves two mediators, but the game is designed for a single mediator; the mediators' names have therefore been replaced by *M*. In addition, a long passage in which the mediators ask one of the party to not interrupt the other party, and another one in which

the mediators propose to use a flip-board to take some notes, have been removed. The turn structure, and most importantly the speech acts and the propositions are otherwise unchanged.

(26) a. M: *What would you like out of today?*

b. Eric: *Well, I would like Viv to become part, a productive member of the team. Because we are a team and, you know, Viv was appointed to be my equal.*

c. [. . .]

d. M: *Okay.*

e. [. . .]

f. Viv: *Some feeling of trust that I can do the job.*

g. [. . .]

h. M: *In what sense?*

i. [. . .]

j. Viv: *I mean, I do have a string of qualifications, you know, I have done other jobs, and I need to be able to, to be allowed to prove myself. That's it I suppose.*

k. [. . .]

l. M: *Are there any questions there then, going back to this?*

m. Eric: *Well, I don't know whether Viv feels that she's able to take on any projects at the moment.* [. . .]

n. M: *Would you be happy to work through what that project plan might look like?*

o. Eric: *There seems to be some similarities between what Viv's identified and the things that. . . how I see things happening. So, it might be an idea to just look at the similarities.*

p. M: *Right.*

q. Viv: *Yes, I agree.*

Three participants have been asked to use MDG′ in Arvina and to follow, as much

as possible, the moves (that is, the types and contents) of the excerpt provided. Arvina allows or prevents some moves according to MDG′ rules.

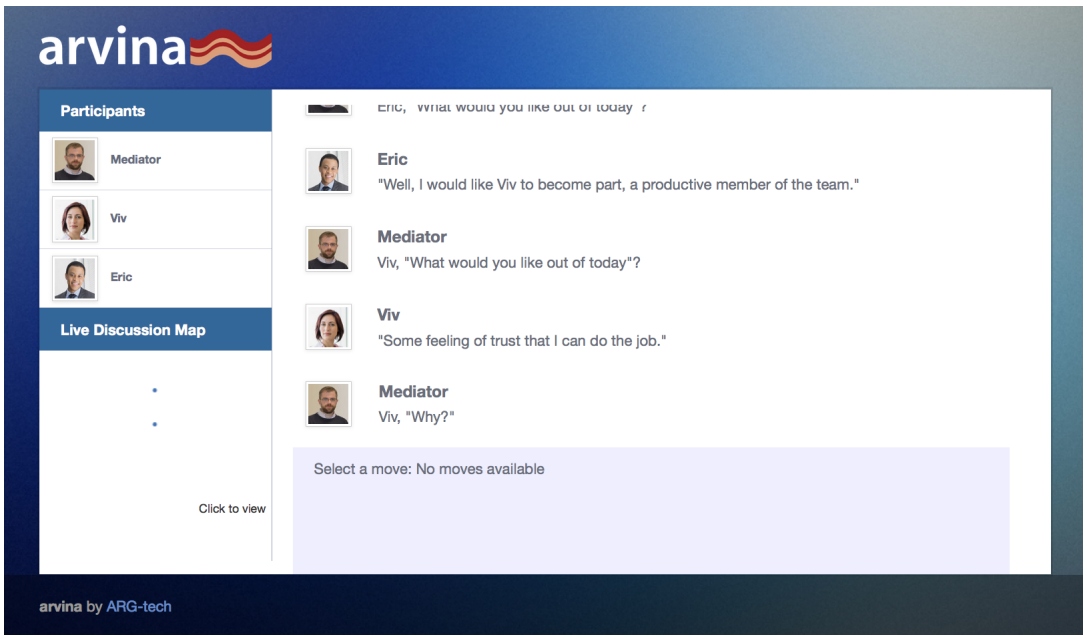

Figure 6.24: MDG' in Arvina

Figure 6.24 is a screenshot of MDG′ executed in Arvina. The users advanced the propositions of Example 26. We can see Eric answering Mediator's Pure Question, and Mediator asking the same question to Viv; Viv then answers, and Mediator pure-challenges her. The bottom banner with "Select a move: No moves available" shows that after this PCh, M is not authorised to perform another move until Viv answers.

Table 6.8 shows which MDG′ rule has been used (or triggered) in the execution of the game.

Table 6.8: MDG rules executed in Figure 6.24

Turn in Example 26	Turn in Arvina	MDG rule
26a	Eric, what would you like out of today?	SR3.1′
26b	Well, I would like Viv to become part, a productive member of the team	SR3.2′
26d	Viv, what would you like out of today?	SR3.3′
26f	Some feeling of trust that I can do the job.	SR3.4′
26h	Why?	SR4.3′

First, the participant playing the role of the mediator started the game by asking to the participant playing the role of Eric "What would you like out of today?". This Pure Question initiating the game corresponds withSR3.1′. As an answer, Eric was forced by

SR3.2′ to assert a proposition: “Well, I would like Viv to become part, a productive member of the team”. In the transcript, at turn 26d, the mediator said “Okay”, but the rule SR3.3′ forces M to ask both players the same Pure Question; the participant therefore had to ask Viv the question ‘What would you like out of today?”. She answered with the proposition corresponding with turn 26f as is regulated by SR3.4′. Then, in the transcript, the mediator said “In what sense?” at turn 26h. MDG′ obliges M to challenge the participants’ first propositions (SR4.1′ and SR4.3′). Therefore, only the generic move “Why?” was available to M, who decided to ask Viv the challenge. Finally, the game also forces parties to answer questions and challenges, and forbids M to perform any other move after a challenge (SR1′ and SR2′). Therefore, the participant playing M had to wait for Viv to answer, as is visible on his screen, on the bottom banner of Figure 6.24: “Select a move: no move available”. This screenshot and the summarising Table show that MDG′ executed in Arvina captures dynamics which do occur in real-life dialogues; they testify that the rules have been correctly defined and rightly executed in the conversational system Arvina.

6.5 Conclusion

In this Chapter, genuine mediation dialogues have been compared with MDG rules, with the view to evaluate its credibility. Most of the rules of the game have been found in a relatively small set of excerpts, evidencing that MDG captures dynamics which occur in real mediation dialogues. MDG rules which were not, at first, found in the excerpts have been redefined to capture the actual mediation dynamics, leading to an improved new version of the game: MDG′. Namely, a new set of rules has replaced the ones of MDG which dealt with the Withdrawing type of move. Empirical analyses of the data on which MDG′ has been constructed have shown indeed that none of the speakers explicitly withdraws a proposition; instead, speakers use different speech acts, such as Restating, to show that they are not committed to a proposition anymore. Moreover, the possibility for parties to argue before being challenged has been added to MDG′; this more accurately matches data coming from analyses of debates and mediation discussions.

The evaluation of MDG and its revision have allowed building a dialogue game which

captures dynamics occurring in mediation. However, two important dynamics have been found in the excerpts which are not captured by MDG′ rules. These represent challenges which can be tackled through in-depth analyses of mediation dialogues. More specifically, it will be necessary to further explore the argumentative and dialogical characteristics of mediation discussions with respect to the dialogue types identified by Jacobs and Aakhus (2002b); moreover, the speakers' use of meta-discourse too will need a careful study of the discursive context, as will be shown in next chapter.

The evaluation process has therefore permitted refining the original MDG to make it closer to the reality of mediation dialogues. The goal of the present work being to develop a computational tool for trainee mediators, the improved version of the game has been executed in a conversational support system. MDG′ rules have indeed been defined so that parties can advance claims on a particular topic of dispute while mediators have the control of the discussion via questions and challenges. In executing MDG′ in Arvina (Section 6.4.2), it has been shown that the dialogue game can be used in a computational system and is sufficiently well developed to model a real mediation. The main interest of having implemented MDG′ in the Dialogue Game Execution Platform is that it can be played by human players on platforms such as Arvina. Moreover, the formalisation and implementation of MDG′ in the AIF+ makes it possible to allow virtual users to advance realistic moves coming from the largest data base of arguments, AIFdb.

MDG′ therefore offers advances on both theoretical and practical sides. It extends knowledge on dialectical systems and mediation discourse, while at the same time finding real utility in supporting the ever-growing practice of dispute mediation. Its successful implementation testifies that the game is reasonably well replicating mediation dialogues and can later be improved and given to mediators for an end-user evaluation.

Chapter 7

Metatalk

We have seen throughout this work that dialogues in mediation contain moves referring to the shape and content of the discussions. In other words, the discussions are not mere series of claims, counter-claims, questions and challenges: speakers also talk about what they are talking about. For example, mediators suggest issues to be tackled (see e.g. Chapter 4) and disputants report their opponent's words to explain their behaviour (see e.g. Chapter 5). By comparing real mediation dialogues with the dialogue game developed in Chapter 6, the need to account for such dynamics has been highlighted. Delivering a computational tool to mediators, as a matter of fact, requires knowing and acknowledging the main characteristics of mediation dialogues.

Speakers talking about the discussion in which they are involved create a discussion about the discussion. This theme has been studied in different communicative contexts (e.g. political discourse (Martínez Guillem, 2009), academic discourse (Ädel, 2010; Swales, 2001) or dialogues (Schiffrin, 1980)) and is known as meta-discourse or meta-talk (Schiffrin, 1980), in the case of spoken discourse. Meta-discourse is usually defined as words or phrases which do not add information at a propositional level but allow organising, clarifying or reacting to a message (Vande Kopple, 1985). Most research works have limited themselves to the investigation of meta-discourse to understand its role for organising a discourse; also, written communication has been privileged over spoken communication; and the relationship between meta-discourse and argumentation has hardly been highlighted. Moreover, despite studies on mediation discourse which acknowledge the mediators' role in shaping the discussion and seek to explain their strategies to pre-

serve their neutrality with respect to disputants and their standpoints (see e.g. (Jacobs, 2002)), none has, to the best of my knowledge, investigated the use of meta-discourse in mediation dialogues. If mediators are in charge of the content and direction of a discussion, their contributions must consist of particular phrases referring to the discussion, which, in the literature, is the basic definition of meta-discourse; the relationship between references to the on-going discussion, namely meta-discourse, and mediation argumentative dynamics must therefore be investigated. This chapter proposes a first step towards such an account of argumentative meta-discourse in mediation through corpus analyses to detect mediation participants' discursive tactics and highlight the role and function of a commonly used meta-discourse verb in mediation: SAY. As we have seen in Chapter 4 in particular, Inference Anchoring Theory (IAT) (Budzynska and Reed, 2011) is an analytical tool which helps to show in details how dialogical dynamics create argumentation in mediation discourse. The investigation of meta-discourse in mediation will therefore rely on IAT to explore the relationships between dialogues, arguments and meta-discursive moves.

7.1 Motivation

Let's take two short dialogues from a mediation session. These excerpts are taken from a transcript of a mock-mediation in which the disputants, Sean and Nancy, try to resolve their workplace discrepancies with the help of two mediators, Kelly and Melissa.

(27) a. Kelly Tansik: *Sean, **I just want to go back**. **A couple of sentences ago**, **you mentioned** "psych notes" and **you said** that people have different personalities?*

b. Sean McNeil: *Yes, and part of it has to do with, and **I hate to bring this up** because I know **you're going to get all over me**, the way men and women think. Men and women just think differently.*

(28) a. Melissa Myer: *Sean, **you said** you don't want to have to go back to work just in case some hard feelings are brought up or something. Could you meet for 10 minutes in the cafeteria after shift twice a month?*

b. Sean McNeil: *If it's necessary.*

In Example 27, talk about talk is emphasised in bold letters. "I just want to go back" and "A couple of sentences ago" refer to something which occurred earlier in the dialogue; "you mentioned" and "you said" refer to something which the interlocutor said in the dialogue; "I hate to bring this up" previews something which will be mentioned while "you're going to get all over me" anticipates the interlocutors' reaction to the speaker's coming talk. Example 27 is a good example of the widespread presence of meta-talk in mediation dialogue, and shows that it does have a close relation to argumentation. In the example, two of the meta-talk elements are clearly parts of an argument; see the connector "because" between "I hate to bring this up" and "you're going to get all over me": the speaker argues, not about facts or opinions, but about the discussion itself. Most importantly, this argument has been triggered by the mediator's question, which contains the meta-talk element SAY. In Example 28, the mediator also uses 'you said' and then asks Sean a question to see if he would be ready to meet his colleague Nancy after work twice a month to resolve their problems at work. It is important to note that Melissa does not clearly argue in favour of such an arrangement since she is only asking a question; however, it is easy to reconstruct her reasoning: if Sean does not want to go back to work after a heated conversation with his colleague, then it may be a good idea for Sean and Nancy to meet after their work shift.

As we will see in Section 7.2, whilst many of the meta-talk elements in Examples 27 and 28, individually, have been studied in several studies on meta-discourse, one key issue has never been explored: to what extent does meta-talk play a specific role in overtly argumentative discourse? This is the question which will be tackled here, where the functions of a meta-talk element which is common to both examples – the verb 'to say' – will be explored. In these dialogues, the mediators use SAY but have different tactics: while the first use, in a question, has led the party to argue, the second one, followed by a question, has allowed the mediator to ask the party if he agreed with a proposed arrangement. This chapter therefore aims at explaining the relationship between uses of this verb in mediation discourse and the argumentative, dialogical and rhetorical tactics

of speakers[1].

When SAY is used with the pronouns 'I' and 'you' (as subjects), it is clear that the speaker makes a reference to the discussion participants, i.e. the speaker herself and the interlocutors. Also, SAY refer to past discussions when it is used in the past tense, or to the current talk if used in the present tense. As a consequence, this verb designates aspects of language and carries a meta-discursive role. The verb SAY has been chosen among the many other speech verbs (such as 'to tell', 'to mention' or 'to claim') for two reasons: its high frequency in the Dispute Mediation Corpus, and the fact that it is not a speech act verb (Searle and Vanderveken, 1985), which therefore presents an additional challenge because the speakers' communicative intentions when using SAY are not completely clear (see Section 7.4.2 for more details). Additionally, SAY is considered as one of the most typical discourse reflexive verbs, that is, a verb, which refers to discourse itself (Ädel and Mauranen, 2010; Mauranen, 2010).

Meta-discourse has been the focus of discourse studies, most of the time interested in written text. Meta-talk in spoken communication has mainly been studied in contexts with low interaction between speakers and listeners such as university lectures (Ädel, 2010; Zare and Tavakoli, 2016) and TED talks (Correia et al., 2014). Crismore (2004) shows that meta-discourse is an essential part of the effectiveness of persuasion, however, this research is based only on monological discourse. Exploring meta-discourse in mediation, a highly interactive dialogical context in which argumentation plays a crucial role, is therefore a novel and particularly demanding challenge. This chapter will extend knowledge in meta-discourse in general, but will also bring new insights about how argumentation is performed and managed by mediators. This will bring advances for the study of mediation discourse, which is necessary to understand this increasingly popular process.

[1]Other verbs referring to the discursive activity (such as 'mention' in Example 27) may as well play a role in the argumentation, however, the current investigation focuses on the verb SAY because of its higher frequency in the DMC, as will be shown below.

7.2 Related work

Meta-discourse is defined as discourse which refers to discourse itself or, more precisely, as "reflexive linguistic expressions referring to the evolving discourse itself or its linguistic form, including references to the writer-speaker qua writer-speaker and the (imagined or actual) audience qua audience of the current discourse" (Ädel, 2010, p 75); therefore the reflexivity of language is what is at stake when studying meta-discourse (Ädel, 2010; Mauranen, 2010). As argued e.g. by Martínez Guillem (2009), studying meta-discourse is fundamental to understand discourse in general. It is however one of the hardest elements to account for given that it "is both about discourse and part of it" (Martínez Guillem, 2009, p. 731). The task is even trickier when oral communication is considered, in which people can constantly refer to the other discussants' words, sentences and arguments throughout a dialogue. Meta-discourse has been little studied within spoken language, and the few research works in which spoken communication is considered do not present us with highly interactive communication between different speakers (see e.g. (Ädel, 2010; Correia et al., 2014) (see Section 7.1). Research in the area (e.g. (Ädel, 2010)) nevertheless agrees that meta-discourse has more functions in spoken than in written language.

As shown in (Schiffrin, 1980), many different meta-discursive elements exist, in particular in dialogical contexts. Talking about the occurring talk happens in every conversation and this can take various forms. Schiffrin's study of meta-discourse in dialogical contexts allows a first delineation of what meta-talk elements are. In this study, Schiffrin tries to define how, where and why meta-talk occurs in a dialogue. First, meta-talk expressions can focus on one's own talk or an interlocutor's talk. For example, according to Schiffrin, 'that's my opinion' refers to the speaker's talk – probably her previous statement; on the other hand, 'what do you mean?' refers to the co-discussant's talk – the speaker is probably asking him to repeat or elaborate on his previous statement. The author also identified three indicators all focusing on talk itself: metalinguistic referents (e.g., 'the next point', 'let me say'), operators (e.g., 'wrong', 'for example') and verbs (e.g. 'tell', 'define'). She then identified two types of meta-talk which are not necessarily independent from each other. Organisational elements regulate the discourse and evaluative elements serve to

assess or react to the discourse. Organisational brackets open or close (initial brackets, such as 'in other words' and terminal brackets, such as 'that was my point') a space in which the speaker talks about the discourse. Evaluative brackets, on the other hand, are elements which allow a speaker to e.g. give her opinion about what has been said or to request for explanation (Schiffrin, 1980, p. 218). In addition, some evaluative brackets allow anticipating an interlocutor's talk. For instance, renewal brackets (more generally called reported speech or quoted talk (Stokoe and Edwards, 2007), e.g. 'you say' or 'as I said'), or expressions such as 'don't tell me that... ', 'I hate to say this, but...' or 'I don't say...' give less chance to an interlocutor to challenge or criticise the statement which will follow. Despite an account of a large range of meta-talk elements, this typology has some drawbacks. First, the taxonomy itself does not allow a clear demarcation between the different types of meta-talk. Meta-talk elements which can serve the organisation of the discourse often have an evaluative function when the focus is on the interlocutor's discourse; for instance, note the difference when the phrase 'that's the point' refers to the speaker's standpoint or her interlocutor's: a speaker can use this phrase to punctuate her utterance (it then has an organisational function) or to react to her interlocutor's utterance (evaluative function). Moreover, the same phrase can focus on both the speaker's and her interlocutor's talk: in that case the bracket is organisational and evaluative. Therefore, there is no clear distinction between organisational and evaluative brackets. Then, more generally, it is difficult to delimit what meta-talk is and what simply talk is. Finally, it does not present a pragmatic account of meta-talk, therefore its argumentative function is barely considered.

Ädel (2010) proposes another taxonomy of the functions of meta-discourse in written and spoken language. Her study concentrates on academic talk (lectures and student essays), which offers a rich environment for metadiscursive elements. Her taxonomy distinguishes between four main types of meta-discourse: metalinguistic comments, discourse organisation, speech act labels and references to the audience. In (Ädel, 2012), she admits a drawback of her taxonomy, namely that a metalinguistic comment can have different functions; therefore, an arbitrary choice into which the primary function is has to be made. Besides, similarly to Schiffrin's, her taxonomy does not focus on argumentative

functions of meta-talk, however, her category *speech act labels* contains the discourse function *arguing* which, intuitively, would relate to the main aspect of the work here, i.e. the argumentative function of meta-discourse. In her study, this function needs to be clearly signalled, for example in an utterance like 'I argue that' but, as we will see, clearly stating that we are about to argue is not the only way to effectively argue, nor is it the most common.

The biggest issue when studying meta-discourse, and this has been emphasised in most works (see in particular (Ädel, 2010; Mauranen, 2010)) is to precisely define the object of the investigation. The most common strand in the study of meta-discourse regards meta-discourse as a textual interaction and is usually named the interactive model (Ädel, 2010; Mauranen, 2010). This view of meta-discourse is primarily interested in the relationship created between a writer/speaker and their reader/audience; metadiscourse is principally studied through the exploration of discourse elements which organise and set up a discussion or a text. The second strand, the reflexive model (Ädel, 2010; Mauranen, 2010) considers metadiscourse as fulfilling more functions than simply referring to the on-going discourse. It is the view that will be adopted in this study: the function of SAY in argumentative discourse will be determined through close examinations of the context of each occurrence.

To sum it up, all the research works presented in this section provide insightful information with respect to what meta-discourse is, and how to detect it. Ädel's and Schiffrin's taxonomies are particularly enlightening: Schiffrin offers a study of dialogical interactions and takes into account evaluative functions, which are closely related to argumentative functions, and Ädel's categories, although not exclusively fitted for dialogues, also contains elements (such as reformulating, arguing or clarifying) which are close to argumentation as well. Defining the role and function of the meta-discourse element SAY in argumentative discourse, is the challenge taken up here. The decision to focus on a dialogical context, coupled with mediation's specific interactional dynamics, in which the mediator is in charge of the argumentative discussion and must not yet take position, makes the task even trickier. As we have seen throughout the present work, mediators' main role is to ensure a sound argumentative dialogue while, at the same time, staying

neutral; their contributions to the discussion are therefore subtle. In particular, if they cannot argue, it is hard to detect their argumentative moves and relate them with meta-discursive moves. This, and the few indications provided by the literature – principally interested in monological or hardly interactional contexts – represent a challenge for the present goal: laying the foundations for a taxonomy of meta-discourse in argumentative dialogues.

7.3 Meta-talk in mediation discourse

In this section, it will be shown that SAY as meta-talk (or meta-discourse) is unusually common in mediation dialogues. Relying on Schiffrin's and Ädel's taxonomies, some examples of dialogues taken from the Dispute Mediation Corpus (hereafter DMC) will be described. It will then be shown that the two taxonomies fail to account for the argumentative function of the meta-discourse element SAY.

(29) a. Eric: *I can leave at any time then if I want to?*

b. Mildred: *Yes you can, either of you can.*

c. *But, as I say, we hope that you will stay and we hope you will want to stay to talk through your differences that you can put right today.*

Example 29 is taken from the transcript of a mock-mediation for the resolution of a workplace conflict. The dispute involves two parties, Viv and her boss Eric, and two mediators, Mildred and George. This excerpt comes from the beginning of the mediation, when mediators explain how the session will unfold. In the example, Mildred uses the meta-talk element: 'as I say'. According to Schiffrin, this self-repair acts both as an organisational bracket (she emphasises the fact that she already mentioned that) and as an evaluative bracket (she puts into relief her statement for Eric's attention). In Ädel's taxonomy, this meta-discourse element would fall in the category of *reviewing*: Mildred mentions something she already said. Both taxonomies agree on the fact that this meta-talk allows the speaker to refer to something already mentioned; they do not tell however whether the speaker is simply repeating a sentence, and in which case, why she is doing so. As we will see in Section 7.4, a close analysis of this utterance and the broader context

of the dialogue is therefore needed to understand why Mildred emphasised this.

Let's consider Example 27 again. We have seen that this very short dialogue is filled with meta-discourse: 'I just want to go back', 'a couple of sentences ago, you mentioned', 'you said', 'I hate to bring this up', 'you're going to get all over me'. First, Kelly proposes to go back to what Sean said earlier in the mediation (this would correspond to *reviewing* in Ädel's taxonomy); then, Sean answers and also talks about the world of the discourse: he does not want to bring up, not a physical object – which would belong to the 'real world' – but a thought, a sentence, an opinion, and anticipates his co-discussants' reaction in this same discussion if he does "bring this up": they will probably "get all over" him, once again, (probably) not physically but verbally. The question then is: how is it that, even by presenting so many meta-discursive elements, the speakers clearly make sense and have a reasonable and understandable discussion? In particular, consider Sean's move: he does not want to talk about something because he anticipates one of his interlocutors' (verbal) reaction. What should be noted here is that, with two meta-discursive elements, a speaker is able to build an argument, which shows that meta-talk can have an argumentative function. Moreover, this argument has been triggered by the mediator's question which contains the verb SAY. An account of the relationship between the question and the following argument is therefore necessary to detect the argumentative technique of the mediator when she used the meta-talk SAY.

These two examples show that SAY as meta-discourse is present in mediation dialogues but Schiffrin's and Ädel's taxonomies do not help capture its argumentative function. A method to elicit this function is given in the following section.

7.4 Methods

The study of meta-talk presented here was carried out in two steps: first, a shallow linguistic analysis is performed, in which the verb SAY is searched inside the DMC, currently containing over 28,000 words. Then, only uses with 'I' and 'you' as pronoun-subjects were taken into account. Finally, of these occurrences, only those in the past tense and those in the present tense were considered. As mentioned in Section 7.1, constraining the current investigation to usages of the verb SAY to these pronouns and tenses is motivated

by the fact that (i) these occurrences only designate the participants involved in the current discussion, and (ii) mediation is a dialogical context in which speakers have to talk about the past (e.g. when parties explain the origin of the dispute) as well as the current situation (e.g. when the mediator summarises the session).

7.4.1 Corpus analyses

This study relies on corpus analyses of the Dispute Mediation Corpus (DMC). As we have seen in Chapter 4, the raw material consists in transcripts (and excerpts of transcripts) of mediation sessions. The examples presented throughout the chapter come from such transcripts of real and mock mediations obtained from academic publications, mediation centres and role-plays found on the internet. Empirical data provided by transcripts of mediation sessions are analysed using Inference Anchoring Theory (IAT). Let's take Example 27 again, and apply IAT, in Figure 7.1 below, to show how the model can be used to make explicit the argumentative and dialogical structures of this dialogue full of meta-discursive moves.

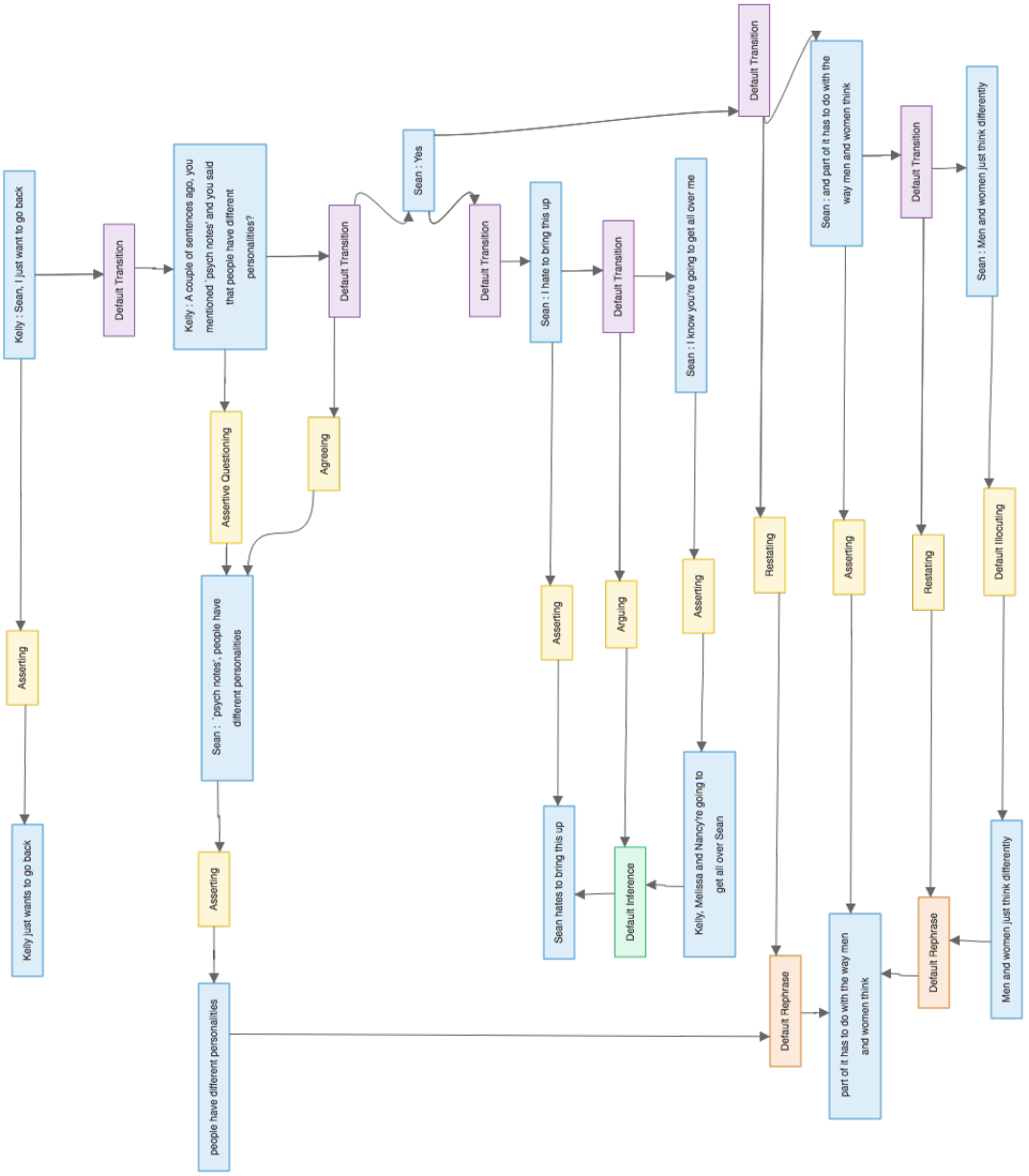

Figure 7.1: Analysis of Example 27 - Argument map # 10782

In Figure 7.1, we can see that Sean answers 'Yes' as a response to Kelly's utterance "A couple of sentences ago, you mentioned "psych notes" and you said that people have different personalities". Sean also asserts that "Men and women just think differently". Here, when he says 'Yes', Sean agrees because this is a response to Kelly's question "you said that people have different personalities?". Similarly, we can only affirm that Sean is arguing because of the relationship between his two locutions "I hate to bring this up" and "you're going to get all over me". Taken independently, these speech acts are merely claims, but, considered together, it clearly appears that they perform an illocutionary act: arguing. In the argumentative structure, on the left-hand side of the figure, this is represented by the Default Inference node between the propositions *Sean hates to bring this up* and *Melissa, Nancy and Kelly are going to get all over Sean*. This means that the first proposition is the conclusion and it is supported by one premise, the following proposition.

In this Figure, we can also see that *Men and women just think differently* is a Rephrase of *people have different personalities*. Moreover the sentence "you said that people have different personalities" is reporting a sentence previously uttered by Sean. By unpacking the propositional content of the reported speech (on the left-hand side, i.e. the proposition) and the propositional content of the reporting speech (in the middle, i.e. Sean's locution), we have seen that IAT shows that reported speech has two contents: the main proposition: *people have different personalities* and the reported locution: *Sean said that "people have different personalities"*. As we will see throughout this chapter, this dialogical technique has several argumentative advantages. In this example, the reporting speech (i.e. Kelly's locution) carries the Assertive Questioning force: Kelly is looking for Sean's (dis-)agreement, and Sean answers 'Yes' to show that he agrees. The agreement (which can only be considered as such because it follows an Assertive Question, see Chapter 3) targets the reported speech; this means that Sean agrees with the fact that he said such a thing. Sometimes, as we will see in the following sections, the agreement targets the propositional content: the speaker agrees with a proposition, not with the reported speech.

Example 27 and its analysis in Figure 7.1 demonstrate that IAT allows showing the argumentative facet of meta-discourse and to relate it to discourse tactics which Ädel's

and Schiffrin's taxonomies fail to grasp. As we will see in more detail in Section 7.5, the fine-grained analyses highlight three different – though interrelated – structures which allow detecting speakers' tactics. Their techniques can be identified on each of these levels: while argument structures (i.e. the relationships between propositions) reveal argumentative tactics, and dialogical structures (i.e. the relationships between locutions) reveal dialogical tactics, the dynamics on the illocutionary structure level capture rhetorical tactics.

7.4.2 The verb SAY

Shallow statistical analyses have been carried out on the DMC and have shown the ubiquity of speech verbs. Among them, SAY is the most frequent, and is used several times by all speakers in the corpus. Out of the 3,093 different words found in the corpus, SAY appears in the eighth position in terms of frequency of verbs (339 occurrences), after BE, DO, KNOW, THINK etc., and is the most frequent discourse verb, much more than TELL which is in the second place with 82 occurrences. As already mentioned, the verb 'to say' may be considered as one of the most typical examples of meta-talk: when a speaker uses the verb 'to say', she is referring to an event which has happened, is happening or will happen in the discourse itself. However, SAY is not itself a speech act verb, which makes it hard to determine the speaker's intentions. As summarised by Proost (2009), SAY, in contrast with CLAIM, PROMISE or THREATEN which are more specific, does not explicitly give information with respect to the speaker's attitude. When a speaker states "I will explain the rules of the game to you in a second", we know that she wants to, and will, provide explanations and guidance to her interlocutor; however, if she claims "I'm saying that I'm leaving", we cannot know, a priori, what her intention is: is she just informing, or threatening her audience? Is she rewording a previous utterance? The verb SAY, therefore, does not say anything about the speaker's aim before an analysis of the broader context is carried out. In the literature (in sociolinguistics in particular), SAY is mainly studied within cases of (self-)reported speech, to explore stance taking or its role as an extra-dialogical particle. In (Clift, 2006) and (Rubin Damari, 2010), reported speech is referred to as constructed dialogue. Schiffrin (1980) calls reported speech *re-*

newal brackets and considers that, when they are applied to someone else's talk (i.e. not the speaker's), they have an evaluative function.

For the present study, the verb SAY was searched in its different variants, and only occurrences of SAY with first and second person singular pronouns, and in the present and past tenses were kept. Uses in the future tense and the conditional were then discarded. Eventually, SAY with first and second singular pronouns and in the present and past tenses represents 28% of all occurrences of SAY. Table 7.1 summarises the uses of SAY in the DMC which have been considered for the present work: simple present, present progressive, simple past, past progressive, present perfect, present perfect continuous and progressive, past perfect, past perfect continuous and progressive. We have seen that future and conditional are not taken into account, but reported speech (in present or past tenses) is considered.

Table 7.1: Uses of SAY in the DMC

Generic expression	**Variants**	**Occurrences**
I said	- I said - I was saying - like I said - I didn't say - I've said - as I said	25
you said	- you were saying - you said -you had said - as you said - like you said - you just said	17
I say	- I'm saying - what I'm saying - as I say - I'm not saying - when I say - that's not what I say	23
you say	- you're saying - as you say - you're not saying - you say - what you're saying - are you saying - why don't you say - when you say	29

Statistics also reveal that mediators use SAY less than parties: out of the 94 occurrences considered, 37 are uttered by a mediator. Note, however, that the majority of mediators' uses are with YOU as pronoun subject: mediators use "I say" or "I said" only seven times. These numbers align with the idea of neutrality of mediators: parties' positions are more important than mediators'.

As a comparison, the same statistical analysis has been carried out on a sample of the Moral Maze corpus MM2012c (see Chapter 3) of similar size (23,930 words against 23,979 for the the DMC) . Although the number of speakers is higher than in mediation, we have seen that the dialogical setting is close to mediation sessions: the moderator asks questions and proposes new issues to be tackled, and panellists and witnesses are the ones who argue and actually discuss the issues. This corpus presents us with other characteristics similar to mediation: dialogues are slightly constrained; they are very dynamic (turns rarely exceed six locutions in both contexts) and references to what is happening or has happened in the discussion are also common (e.g. the last 10 minutes of a one-hour long Moral Maze episode are devoted to summarising participants in the debate's points of view). Results of the statistical analysis confirm that SAY is very common in mediation dialogues: eventually, SAY used with 'I' and 'you' in the past and present tenses appears 94 times in mediation against 33 times only in MM2012c. This shows that the meta-discourse element SAY has a particularly important place in mediation, which therefore represents an ideal context for the current investigation.

7.5 Functions of SAY in mediation discourse

In this section, the argumentative functions of SAY in mediation discourse which IAT has allowed discovering are presented. Argumentative function is understood here in a broad sense: arguing is of course considered, but aspects of argumentation which are typical in dialogical discourse are also taken into account. Agreeing, disagreeing, arguing and restating claims are dynamics proper to argumentative discourse. The following subsections present the three functions fulfilled by SAY as meta-discourse in mediation dialogues, that is, conveying agreement and disagreement, arguing and restating.

7.5.1 Agreeing and disagreeing

A first function played by the meta-talk element SAY which was discovered during corpus analyses consists in conveying agreement and disagreement. Let's first consider Example 30.

(30) a. Therese: *I wish that dad would listen to people a bit more.*

b. [. . .]

c. Mediator: *When you were saying, Therese that you wish that your father would listen to people more, were you one of those people also?*

d. Therese: *I wasn't talking about myself but it would be nice.*

In this excerpt, taken from a mediation involving a father and his daughter, with the meta-talk "when you were saying", the mediator asks Therese if what she claimed implied something else (if she is part of the people her father should listen to). The IAT analysis is given in Figure 7.2.

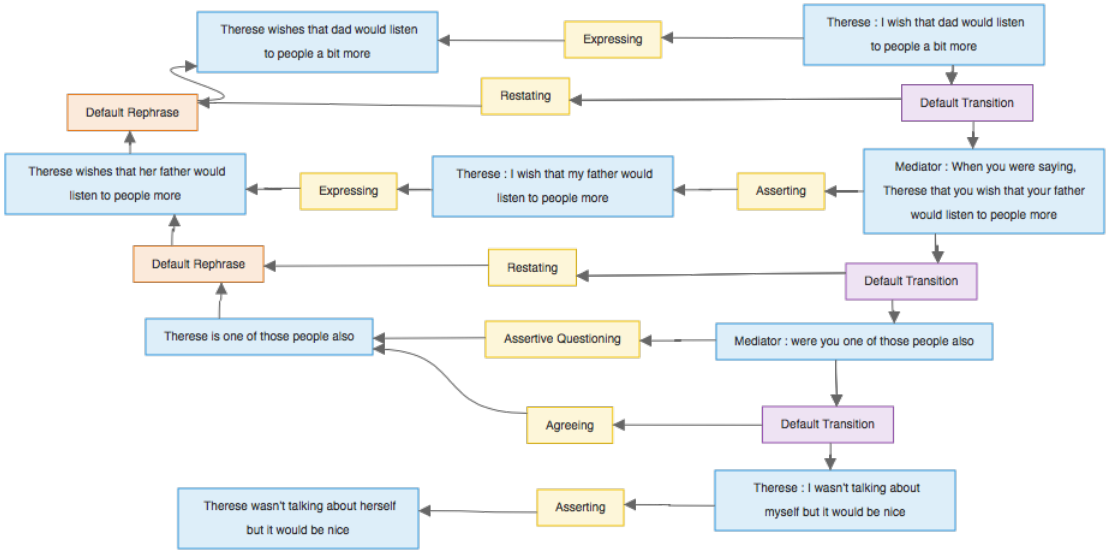

Figure 7.2: Analysis of Example 30 - Argument map #10279

We can see that at turn 30c, SAY is used to repeat Therese's claim: the mediator first reports her words and then asks an Assertive Question rephrasing Therese's claim: her dad should listen to people more and she is one of these people . Therese answering "it would be nice" shows that she agrees with the content of the mediator's question. The mediator has thus managed to trigger the disputant's agreement without having claimed anything however: because it is under the form of an Assertive Question, his move does

not jeopardise his neutrality, however it allows requesting a clarification of the disputant's viewpoint. In the end, he has not stated anything but has subtly pushed the party to agree with a proposition, as if she was the one who made such a point. This figure shows the mediator's technique: he used the propositional content of the party's claim and then rephrased the propositional content of the reported speech under the form of a question. SAY here is not directly used to agree or disagree; but, it is used to report a locution which is then rephrased so that the mediator can trigger the party's agreement. These dynamics reveal an argumentative tactic: using 'you said' to report a party's speech and restating the propositional content with a question, has allowed the mediator to trigger the party's agreement.

(31) a. Sean: *You say that you want attention, but, at the same time, you don't want me to bring attention to you.*

b. Nancy Butler: *What I'm saying is that when I am speaking, to be interrupted in front of my peers so you can tell a joke is unacceptable.*

Example 31 captures the exchange between two disputants, Sean and his colleague Nancy. Both speakers use the meta-talk SAY: "you say" and "what I'm saying". The analysis is given in Figure 7.3.

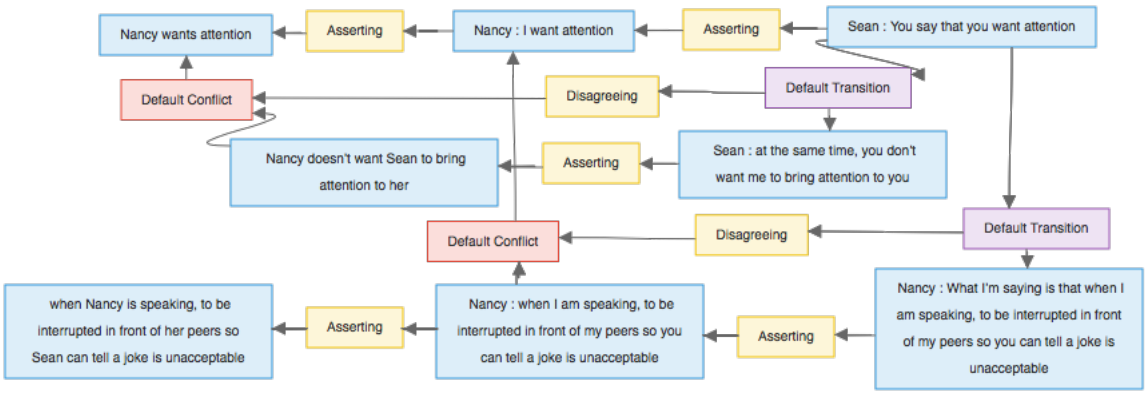

Figure 7.3: Analysis of Example 31 - Argument map #12402

As shown by the IAT analysis, by using "you say", Sean is reporting Nancy's speech. The top middle box represents this reported speech; what Sean is doing is saying that Nancy says she wants attention. Then, Sean shows that he disagrees with the fact that she wants attention by counter-claiming that she does not want him to bring attention to her:

see the Default Conflict node between the first two turns. In response, Nancy also uses the meta-talk SAY, however, the pronoun subject here is 'I', meaning that she refers to her position, not her opponent's, as Sean did in the previous move. The analysis shows that she disagrees with Sean, or more precisely with the content of Sean's reporting speech. This time the Default Conflict node targets another type of content: the reported speech. What Nancy is doing is disagreeing that she said that she wants attention. This does not mean, however, that she does not want attention; rather, it means that she did not say such a thing. This example and the analysis show that reporting someone's talk is convenient for a speaker to show that he disagrees with an opponent, as Sean did in turn 31a, however he took the risk that his co-discussant denies having said what he reported. Nancy, indeed, reported her own words to correct him. Figure 7.3 shows two different tactics. Sean used the propositional content of a reported speech to show his disagreement. His tactic, as in Example 30, is therefore argumentative. On the contrary, his opponent used the content of two reported speeches (i.e. reported locutions) to show that she disagrees: her tactic is then dialogical.

(32) a. Mediator: *I can see what you're also saying too Ben that uh, I think you resent Gerry dictating to you what you should do on your visitation.*

b. [. . .]

c. Mediator: *I don't think that's not your intent Gerry to dictate to Ben?*

d. Gerry: *No*.

In Example 32, taken from a mediation in which a divorcing couple tries to find arrangements for their child's custody, the mediator uses the expression "you're saying" to report Ben's words. He then asks Gerry whether what Ben thinks – or at least what he thinks Ben said – is the case, to which Gerry answers negatively. The analysis of the example is given in Figure 7.4.

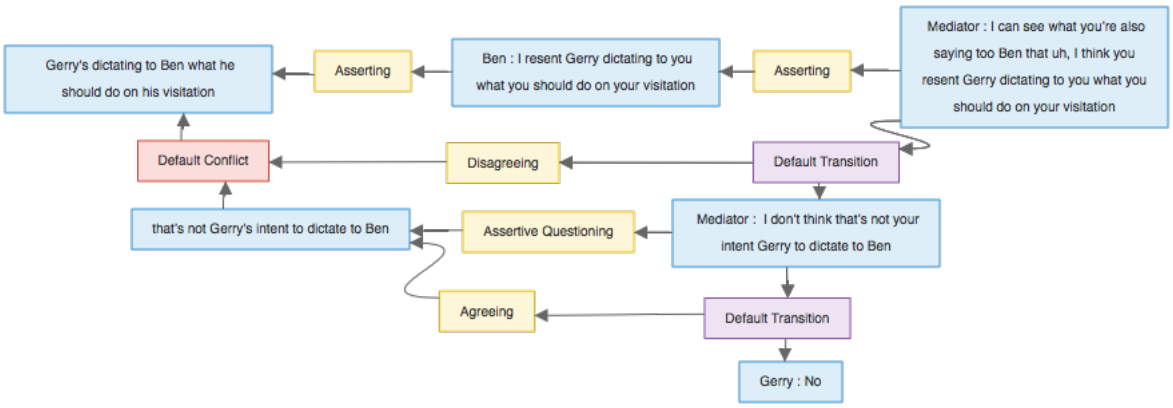

Figure 7.4: Analysis of Example 32 - Argument map #12403

The neutrality of the mediator cannot, a priori, be questioned: he is not taking a stand because he reports a party's speech and then asks the other party a question. However, the analysis demonstrates that the question allows him to disagree, although not directly with a party but with the proposition of the reported speech. Moreover, this question triggers the other party's agreement. The mediator has thus managed to clarify the parties' positions: he used Ben's words to verify whether his opponent agrees with him. Reporting one party's words and Assertive Questioning permitted him to counter-argue a well as to look for the other party's point of view. Here again, the mediator's tactic is argumentative: he used the propositional content of a reported speech to trigger the party's agreement.

Examples 30 to 32 have shown that using the meta-talk expression SAY in various forms allows speakers to show or to trigger (dis-)agreement. In Example 30, the mediator used SAY to report a party's claim and then questioned the same party in search for her agreement. The analysis has shown that the dynamics happen at the level of the argument structure, eliciting an argumentative tactic. In the second example, both parties used SAY, however, their techniques were different: Sean gave a counter-argument to what Nancy (may have) said, while she disagreed on having said such a thing. While Sean's technique happened at the argument structure level, Nancy's one is dialogical since her disagreement targets a reported locution. In Example 32, finally, the mediator used SAY to subtly disagree with a party (he disagreed with the propositional content of the reported speech) and then managed to show that the other party agreed with him. Both techniques have been shown to occur on the argument structure level, which shows that this tactic

was argumentative rather than dialogical.

7.5.2 Arguing

Arguing is the identified second function of SAY. Arguing is understood here as giving support(s) to a main claim (Toulmin, 1958). This section will show how argumentation is performed when speakers use the meta-talk verb 'to say'.

(33) a. Nancy Butler: *My cubicle is way too close to yours, and perhaps what we could do is reorganise a little bit. You said you're into change and innovation.*

Example 33 is taken from a workplace mediation. In this excerpt, a party, Nancy, is negotiating with her co-worker and co-disputant: they do not get on well so she proposes to reorganize the office so that their cubicles could be not so close. Nancy uses the meta-talk element "you said" to refer to what the other disputant (supposedly) earlier on mentioned in the mediation. The analysis of the example is given in Figure 7.5.

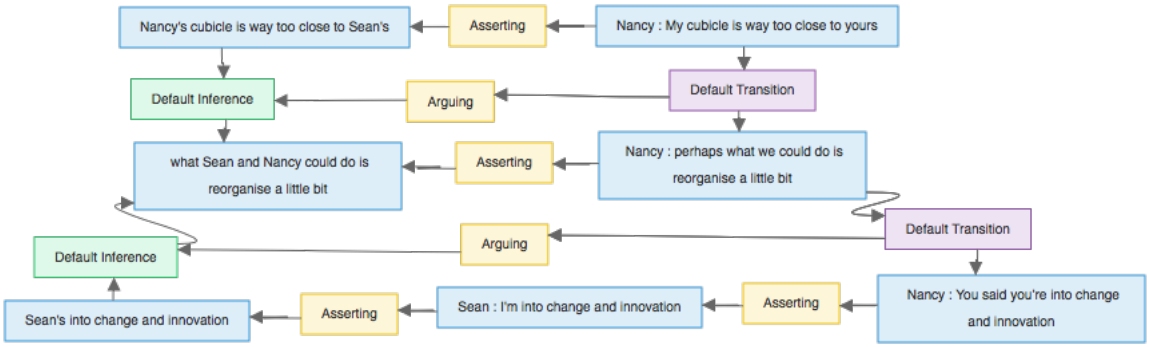

Figure 7.5: Analysis of Example 33 - Argument map #12404

The analysis shows that Nancy is arguing to have the organisation of cubicles changed: Sean's and her cubicles are too close, therefore they should organise them differently. She further supports her claim by reporting Sean's words ("you said you're into change and innovation"). The content of the reported speech (i.e. the proposition which Nancy attributes to Sean) allows her to further argue: Sean is into change and innovation therefore they should reorganise the cubicles (see the Arguing node at the bottom). Nancy has thus built her own argument with two different propositions: her own (cubicles are too close) and Sean's, via reported speech. Nancy's tactic is argumentative: she uses the propositional content of her opponent's claim to infer her own conclusion.

Let's consider another example in which a speaker uses the meta-talk SAY and argues:

(34) a. Viv: *you just say, "No, no, no, I'll do this one (the project), I'll do it." You won't let go and let me learn.*

Example 34, taken from another workplace mock-mediation, contains the meta-talk element "you say": the party, Viv, reports what her boss answered when she proposed to take care of a new project. The IAT analysis of this excerpt is presented in Figure 7.6.

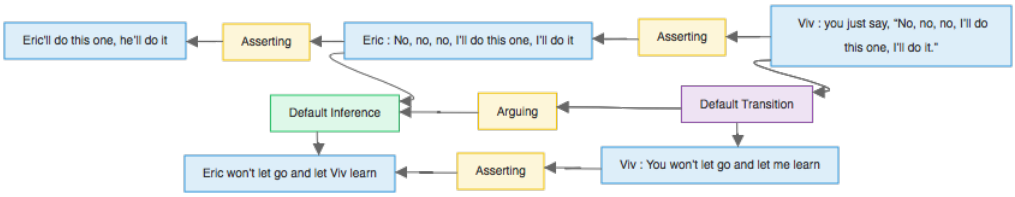

Figure 7.6: Analysis of Example 34 - Argument map #12405

In this figure as well, we can see that the speaker is arguing and uses reported speech; however, this time, the speaker does not use the proposition of the reported speech but the reported speech itself to create an argument. Viv's claim that Eric neither lets go nor lets her learn is not supported by the propositional content of Eric's (supposed) answer, and the answer in itself rather proves (according to Viv) that he never lets her handle any project. Although this excerpt does not present a dialogue, since only Viv is talking, Viv's tactic is dialogical: she uses a reported locution, i.e. Eric's (supposed) locution, to draw a conclusion. In other words, she is creating a dialogue – which may not have happened – which supports her tactic.

Let's now take a third example in which a speaker argues and uses SAY.

(35) a. Sean McNeil: *You said you were in the bathroom crying because I hurt you.*

This example also contains the meta-talk element SAY. In this excerpt, the party, Sean, reports something which his colleague said earlier during the mediation. The IAT analysis is given in Figure 7.7.

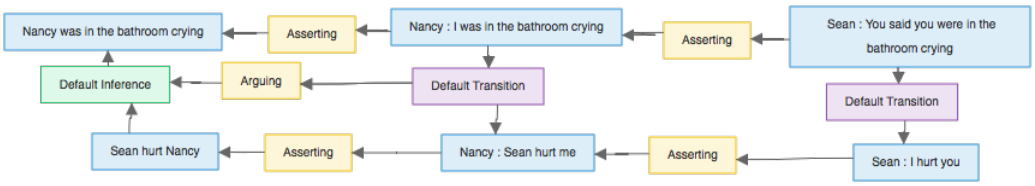

Figure 7.7: Analysis of Example 35 - Argument map #12406

The figure contains an Arguing node but, contrary to the previous examples, it appears that the speaker is not the one arguing: see the Transition node linking the reported speeches. What the speaker is doing is reconstructing an argument which is not his but his opponent's. He is not saying that Nancy was crying because he hurt her but that Nancy *said* that she was crying because he hurt her. The Arguing node anchored in the Transition node linking the reported speeches shows that the argument is not created by the on-going conversation but that it happened in the past and was his co-disputant's. This dynamic can be compared with what happens with reported speech: reported speech allows a speaker to report her own or someone else's words; here, the speaker (Sean) not only reports Nancy's words, but he is also reporting her argument. This tactic is neither argumentative, nor dialogical because the speaker is not arguing at all, he only reports an argument, which is not even his; the absence of illocutionary connection anchored in the transition nodes on the right-hand side of the analysis shows that the speaker has no other intention than reconstructing an argument.

Examples 33 to 35 show that by using the verb 'to say' speakers can construct arguments: to support their claims, they can use some else's words as in Example 34 or propositions as in Example 33, and they can also reconstruct arguments which occurred in the past but are not necessarily theirs, as in Example 35. While the first analysis highlights an argumentative tactic and the following one shows that the speaker argue by deploying a dialogical tactic, the third example shows that the speaker is reconstructing a dynamic, in the same way that the IAT analyses reconstruct the argument and dialogical structures.

7.5.3 Restating

Restating has been identified as being the third function of SAY. Konat et al. (2016) explain that a relation holding between two propositional contents which have a different linguistic surface is a Rephrase. They also demonstrate that the Rephrase relation has different functions: Rephrase can be used to repeat a premise and make an argument sound stronger than it really is, or to have a greater impact upon the audience (e.g. by repeating the same thing several times, the speaker makes sure the hearer will remember her claim). In a dialogue, speakers can Rephrase their own statements as well as others', and in IAT, this is represented via the illocutionary connection Restating targeting Default Rephrase nodes. Corpus analyses on the DMC have shown that restating is often related to uses of SAY, and, as we will see, this can serve several aims, in particular in mediation.

(36) a. Eric: *I'm genuinely confused about what Viv is accusing me of.*

b. George: *Okay. All right. So would you be happy just to carry on Viv, would you [be] happy if Eric used that as a starting point for a couple of minutes to explain how he thinks and how he feels? And then you'd have the same opportunity.*

c. Viv: *Yes, that's fine by me.*

d. George: *Are you sure?*

e. Viv: *Yes, yes.*

f. Mildred: *It might be worth adding, George, just at this moment, when you are speaking, if we could ask the other party just to listen and listen without interrupting and then, of course, you get the opportunity to do the same. I would ask you, Eric, when Viv's speaking to do the same. Is that all right with you?*

g. Eric: *Well, to be honest, you know, as I said, I'm confused about what the problem is in terms of where I've gone wrong or whatever in terms of management style and whatever and so I would rather that Viv told me what she thought the problems were and then I can try and understand what it's all about, basically.*

h. George: *Okay.*

This example involving Viv and her boss Eric, and two mediators – George and Mildred – captures the beginning of a mediation session in which the mediators asked the parties to give their point of view regarding the reason for their presence. Eric answers that he is unsure (Viv initiated the mediation) so George proposes him to answer first. But Eric responds, using the meta-talk element "as I said", that he is so confused that he would rather let Viv start.

Let's analyse turns 36a to 36c and turn 36g.

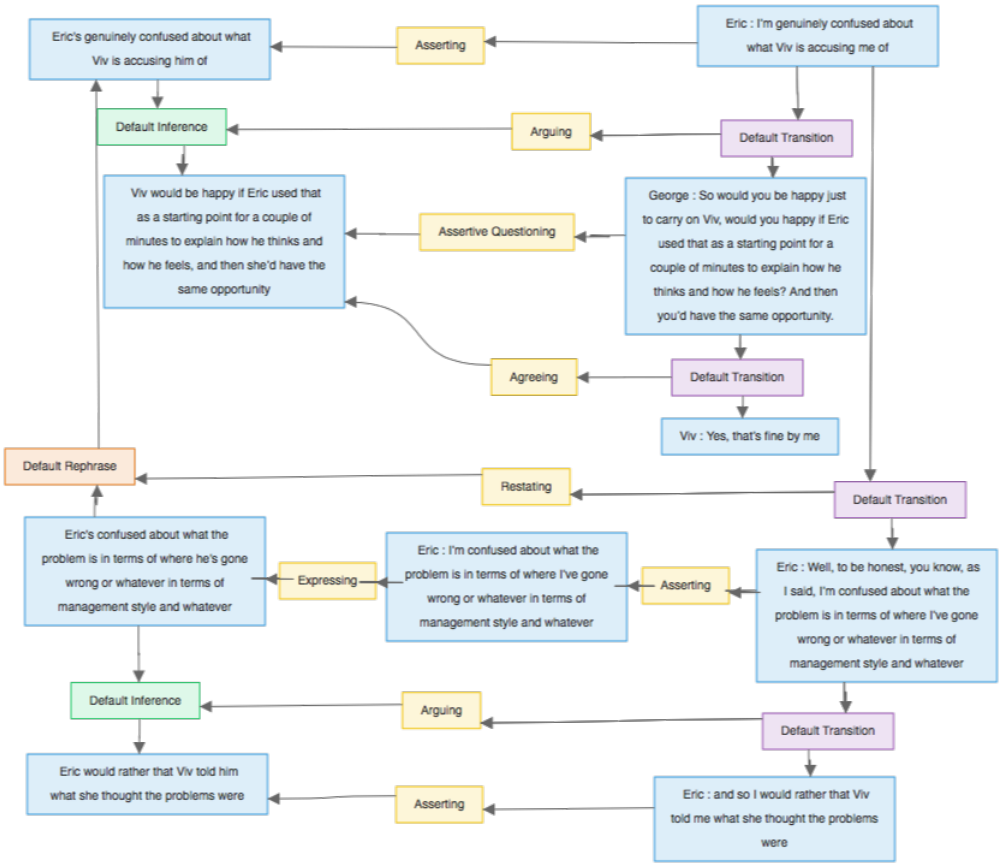

Figure 7.8: Analysis of turns 36a to 36c and turn 36g - Argument map #12407

The IAT analysis shows that with "as I said" in turn 36g, Eric is reporting his own words: see the Default Rephrase node linking this proposition to the one on top of Figure 7.8. Both utterances are semantically similar however, through the restatement Eric clarifies his point of view: he is confused therefore he does not want to be the first person to answer the mediators and would prefer Viv to start. He has therefore constructed an argument (see the Arguing node at the bottom) by reformulating his own claim. The analysis shows that Eric has an argumentative tactic: he uses SAY to report his own words with a slightly different linguistic surface which later on allows him to re-use his own proposition to construct an argument.

Example 37 below presents a similar situation.

(37) a. Sean McNeil: *I don't want to get all heated up and angry and then have to go back to work. Maybe what we should do is have a drink together.*

b. Nancy Butler: *I don't want to go out with you. I don't want to have a drink with you. you're my supervisor.*

c. Sean McNeil: *I'm not dating you. I'm trying to find a casual place which is neutral.*

d. Nancy Butler: *Why don't we meet in the cafeteria and have coffee or lunch?*

e. Sean McNeil: *It doesn't really take it out of the job.*

f. Melissa Myer: *Sean, you said you don't want to have to go back to work just in case some hard feelings are brought up or something. Could you meet for 10 minutes in the cafeteria after shift twice a month?*

g. Sean McNeil: *If it's necessary.*

In Example 37 Sean and Nancy, the parties, try to find a compromise about where to meet and discuss their work problems. Sean proposes to go and have a drink but this offer does not please his co-disputant who proposes to go to the cafeteria. Sean rejects this proposal, so the mediator, Melissa, reacts in turn 37f. In this turn, she uses the meta-talk element "you said". Let's analyse turns 37a and 37d to 37f.

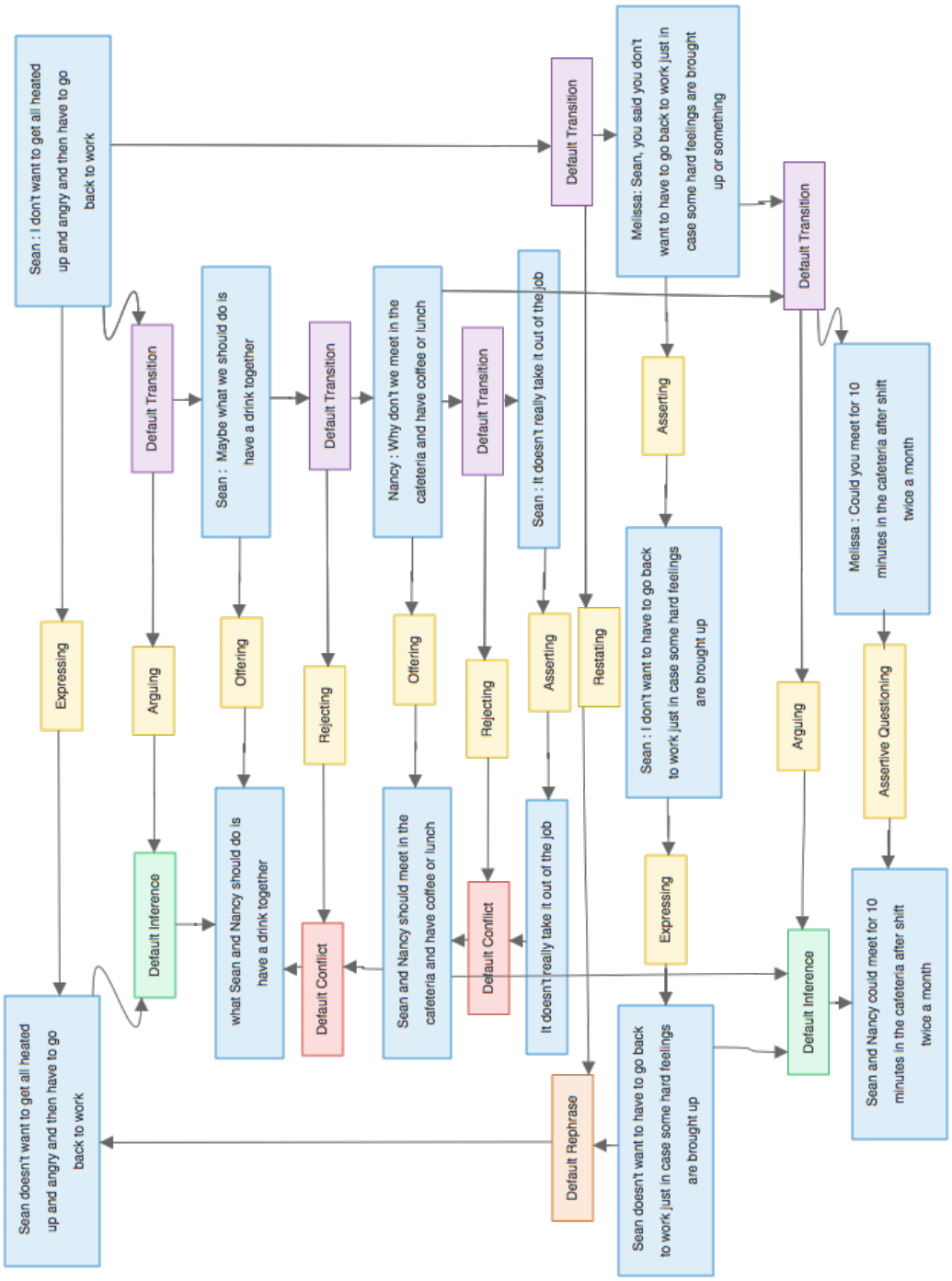

Figure 7.9: Analysis of turns 37a and 37d to 37f - Argument map #11456

The analysis shows that after Sean offered going for a drink because he does not want to go back to work after a heated conversation, Nancy rejects the offer and rather proposes to go to the cafeteria to discuss their problems. Sean rejects her offer as well at turn 37e. The mediator then restates Sean's statement: see the Default Rephrase node indicating that Melissa is restating Sean's proposition by reporting his speech. Melissa then uses this to build an argument: Nancy's offer of going to the cafeteria coupled with Sean not wanting to go back to work in case "hard feelings are brought up" support Melissa's statement that they could meet in the cafeteria after work. The Restating node indicates that the mediator has reused the party's previous claim so that she can use it to build her own argument. Note also that Melissa uses an Assertive Question: the conclusion of her argument is under the form of a question but carries an assertive force as well. This technique is common in mediation: the interrogative form does not undermine the mediator's neutrality since it is only a question she is asking to parties[2], nevertheless the context shows that she manages to subtly argue thanks to the restatement of a party's claim and the use of the other party's offer. The mediator has therefore deployed an argumentative tactic because she used the proposition of a party and the propositional content of a reported speech to draw a conclusion.

In the following excerpt, Sean is asking the mediators about what will happen if his co-disputant tells their superiors about what occurred during the mediation process. The mediator first says that they will talk about this at the end of the session but then asks Sean whether he means that he does not want Nancy to tell the superiors.

(38) a. Sean McNeil: *What happens if (Nancy) goes back and tells the company about what we did and I didn't give her permission?*

b. Melissa Myer: *That's something that we can talk about. If we get towards an agreement, we can talk about that. Are you saying that you want what is said in here at this point to remain confidential to this room?*

The IAT analysis is given in Figure 7.10.

[2]We have seen that mediators' strategies rely on a certain type of questions (which are here defined as Assertive Questions) to suggest arguments: a mediator should not be assertive but can propose issues to tackle or ask disputants whether she correctly understood what a party said (sometimes by reformulating the party's claim). It has also been shown that mediators reframe the parties' claims in order to clarify misunderstandings, for instance. These strategies are the main moves performed by mediators, who try to help parties in solving their dispute.

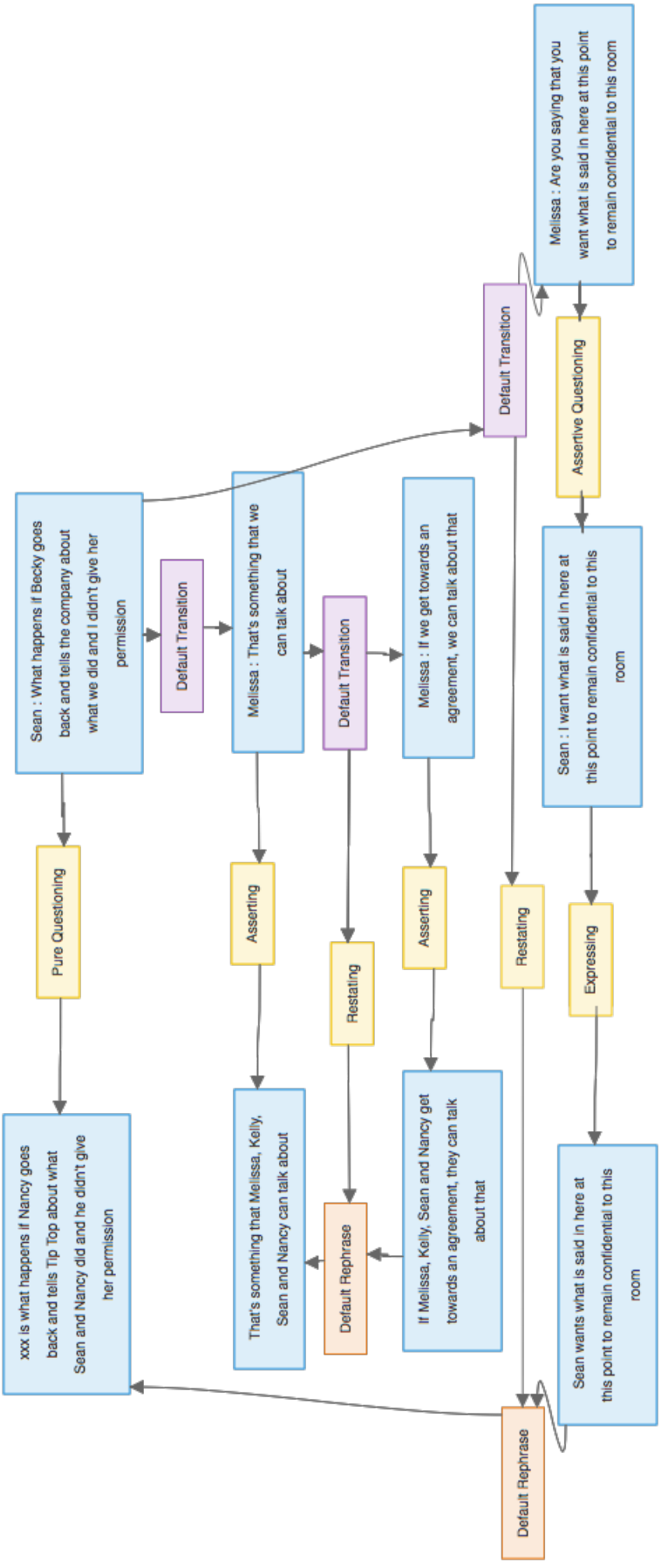

Figure 7.10: Analysis of Example 38 - Argument map # 12408

The analysis shows two important things: when Melissa uses the meta-talk element SAY in the interrogative form ("Are you saying") she is assertive-questioning (i.e. she is looking for the interlocutor's (dis-)agreement); what she is doing is reporting Sean's speech via the restatement of his question: she reframes his question into a different illocution. Indeed, note that Sean's locution was a question, but the reported speech anchors an expressing node. This is a common mediation technique: in order to clarify parties' positions, mediators ask questions (as seen with Example 37) but also reframe their positions, two tactics which Melissa is operating with her simple question "Are you saying [. . .]". This technique takes place at the argument structure and illocutionary levels, which shows that it is both an argumentative and a rhetorical tactic.

In next example, the mediator uses SAY twice: first to talk about what Nancy has said, and then to refer to what Sean has said.

(39) a. Sean McNeil: *She's not the centre of the universe. [. . .]*

b. Melissa Myer: *Sean, I heard Nancy say that she feels like you attack her with your jokes, and when you say that she's not the centre of the universe, it sounds like maybe you don't intend to target those jokes towards her?*

c. Sean McNeil: *I make jokes towards myself.*

The analysis is presented in Figure 7.11.

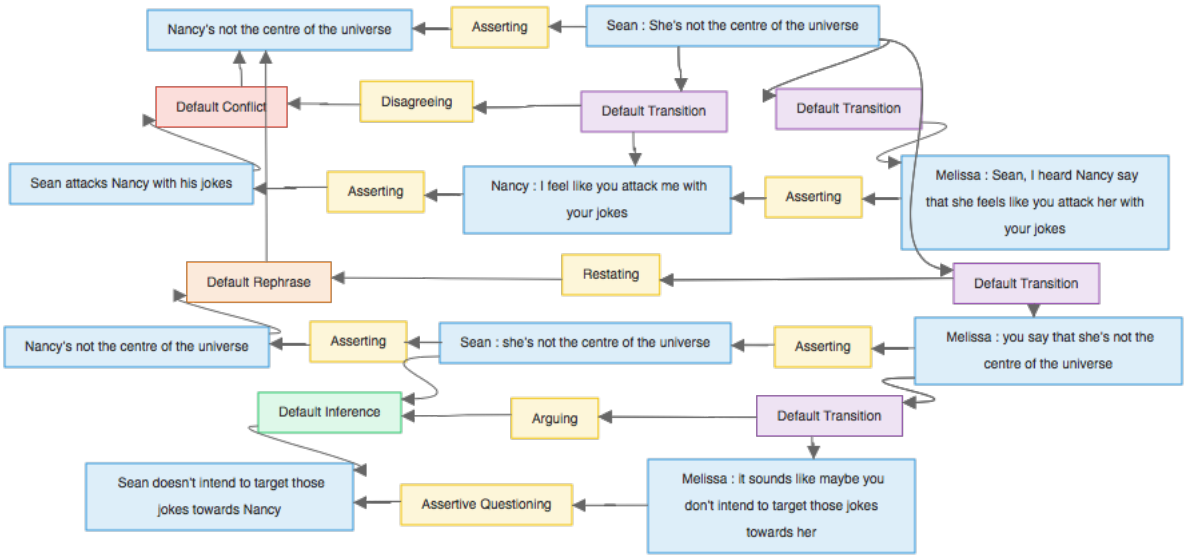

Figure 7.11: Analysis of Example 39 - Argument map # 12409

This analysis shows that the mediator is reporting the parties' speeches in order to

show that they disagree: note that the transition node which targets both disputants' locutions means that Melissa is reconstructing a dialogue. Melissa then restates Sean's claim to build an argument. Note, nevertheless, that the premise of her argument is Sean's reported locution and that the conclusion is an Assertive Question: the argument does not conflict with her neutrality since she has managed to emphasise that the disputants disagree and misunderstand each other. The analysis shows that the mediator has used a dialogical tactic.

Examples 36 to 39 have shown that SAY also allows restating locutions. In the first example, Eric, rephrased his own words to be able to explain his position after the mediators and Viv misunderstood him. In Example 37, the mediator used a disputant's proposition and rephrased the other's to build her own argument: Sean and Nancy do not agree but a compromise between their propositions is possible. The mediator rephrases their proposition and concludes that the propositions together lead to a natural compromise which she presents under the form of a question to check whether the parties agree. In Example 38, the mediator rephrased a party's question to elicit his point of view: while the party was only asking a question, the mediator reframed his proposition into an expressive. In the last example, the mediator rephrased a party's proposition after reporting the other party's claim. She showed that parties disagree, however she also highlighted a misunderstanding between them: if Sean says that Nancy is not the centre of the universe, he cannot be directing his jokes towards her, therefore Nancy should not take these jokes personally. We have seen that the restating function of the meta-talk SAY plays a role at the argumentative, dialogical and rhetorical levels.

7.6 Summary and discussion

Chapter 2 has shown that research into mediation discourse has demonstrated that mediators' role is paradoxical: as third-neutrals they should not take a stand on a party and her standpoints, however they must make sure that disputants efficiently argue so that they quickly manage to resolve their conflict (Greco Morasso, 2011). They are therefore in charge of the discussion but cannot argue themselves. They cannot argue for or against a

solution but can recommend ways to broach issues. In addition, they must deploy strategies whenever discussions derail and disputants face an impasse (Aakhus, 2003). Their contributions are therefore giving shape and direction to the dialogue between disputants. This is why it is matters to understand the ways in which mediators refer to the discussions in which they are involved, and therefore use meta-discourse. In Chapter 4, it was shown that IAT's fine-grained analyses of mediation dialogues offer a unique understanding of the connection between parties' arguments, mediators' tactics and dialogical argumentative activity. In the present chapter, IAT has been applied to mediation dialogues in which the verb 'to say' was used in the present or past tense and with 'I' or 'you' as pronoun subjects, i.e. when reference to the discourse and its participants are made. We have seen that the verb 'to say' is a meta-discursive element playing a crucial role in mediation interactions. While it often relates to reported-speech, such as "you say that you want attention", it also appears in other contexts, e.g. when a speaker wants to make sure he has understood his interlocutor such as in "Are you saying that you want what is said in here at this point to remain confidential". Three functions of SAY as meta-talk have been demonstrated. When a speaker uses SAY to refer to something which was said in the discussion, it can be to agree, disagree (or trigger agreement or disagreement), to (re)build arguments or to restate positions. It has also been shown that these functions play a role in speakers' tactics. While most of the uses of SAY allow speakers to deploy argumentative tactics (visible in IAT analyses on the left-hand side of argument maps), dialogical and rhetorical tactics have also been evidenced (dialogical tactics make use of reported locutions, while rhetorical ones reframe the illocutionary structure of the dialogues). Mauranen (2010) emphasised that strategies and manoeuvres in discourse largely rely on the reflexivity of language, that is, on meta-discourse. The findings reported here bring new information with respect to the functions played by meta-discourse and the discursive tactics of speakers who use it.

In Chapter 6, we have seen that the dialogue game developed for mediation does not capture several dynamics of mediation dialogues, namely reported-speech. The study of meta-talk in mediation has revealed that, through reported speech, speakers deploy several tactics. Using these findings, it will be possible to model and formalise mediation

dialogues in order to include the possibility for users of MDG′ to report their interlocutors' words to build their own arguments, for example. MDG′ will hence be closer to the reality of mediation discussions, in which such a linguistic device, as has been shown, is frequently used. Moreover, it may allow users to deploy a wider range of techniques than is currently possible in the game. Meta-discourse is a wide topic which plays a major role in argumentative dialogues. Its omnipresence in mediation has been a major theme throughout the course of the present research. A thorough study is needed to accurately determine its precise role and function. The current chapter is only a first step in this direction. Moreover, including meta-discursive moves in MDG′ is part of future work: once the different roles and forms of meta-discourse are identified, it will be possible to model these dynamics. The formulation of rules allowing players to advance meta-discursive moves will represent an opportunity to improve MDG′ and make it closer to the reality of mediation dialogues.

To conclude, the study of meta-discourse in mediation is a first step towards an account of the functions of meta-talk in mediation, and in argumentative dialogues in general. Three different functions have been highlighted and related to argumentative, dialogical and rhetorical tactics of speakers. Additional meta-talk elements must be investigated to discover their respective functions and to explore whether the use of meta-discourse contributes to a more efficient resolution of a conflict. Nevertheless, this chapter has laid the foundations towards a taxonomy for meta-discourse in the context of argumentation in dialogues. It has been shown that a single meta-discursive element plays different functions which help capture the argumentative, dialogical and rhetorical tactics of speakers. These findings are essential to grasp the subtleties of mediation discourse, in particular the strategies of mediators who lead the discussion between disputants and manage their arguments while preserving their own neutrality at the same time.

Chapter 8

Conclusions

In this final chapter, first, a summary of the findings presented in the previous chapters will be given; then, some hints for future work will be proposed. Finally, the study will end with some concluding remarks.

8.1 Contributions

The present work has brought a certain number of findings throughout its different chapters, all dedicated to a particular aspect of mediation discourse.

Need for a computational tool to support mediation The work presented here aimed at providing dispute mediation with a computational tool in order to support the mediators' task. The literature review has been useful to know and understand the general aspects of the mediation process. Related research works have shown in particular the importance of argumentation in mediation dialogues. An ensemble of studies from Greco Morasso has also revealed that the argumentative activity in mediation is mainly led by mediators despite their neutrality; as a consequence mediators deploy strategies reconciling their neutrality with their role of discussion leader. This characteristic of mediation discourse is key to understand how dialogues in mediation proceed towards the resolution of a dispute between conflicting parties. As a consequence, it has been accounted for throughout the present study and reflected in the tool proposed to support the mediation argumentative process.

Evidence of the suitability of IAT as an analytical framework for the study of dialogical arguments Even though mediation and its discursive context have been tackled in several studies, none provides enough details about the dialogical dynamics and their relationship to the argumentative activity to explain the dialogical behaviour of mediation participants. In Chapter 3, we have seen that different frameworks exist which allow analysing dialogical argumentation. Inference Anchoring Theory (IAT) is an analytical model for dialogues providing a high level of details which elicit and explain non-obvious argumentative structures. To support such a claim, the framework has been applied to a highly argumentative context of dialogues: the Moral Maze radio debates. First, the theory has been introduced to explain the different steps of the IAT analyses, along with the inter-annotator agreement for each of these steps. Its application to the Moral Maze corpus has revealed some patterns of argumentation in dialogical contexts. For instance, it has been shown that arguments are not constructed only via Assertions supporting other Assertions: some questions – Assertive Questions in particular – also act as elements of arguments. Moreover, arguments can also be mutually built by speakers: a speaker's claim can act as a premise for another speaker's argument. The overall weighted $\kappa = 0.68$ has proved that IAT is a stable framework. This preliminary study was necessary to check that IAT was stable enough (verified by the good κ score) and detailed enough to discover non obvious dialogical and argumentative patterns in highly interactive discussions. Findings on the Moral Maze corpus study helped understand how speakers typically behave in dialogues, and ensured, later on, a smooth application of IAT to mediation discourse.

Creation of the first corpus of mediation dialogues In-depth analyses of dialogues in mediation sessions with IAT have been the starting point of the work presented here. Unfortunately, the principle of confidentiality which characterises this dispute resolution process makes it hard to obtain this type of data; as a consequence, it has been proposed in Chapter 4 to gather a corpus of mediation dialogues in the interest of the present study, as well as of other academics'. After gathering both extracts of and entire mediation transcripts from different sources (academic articles, mediation services, etc.), corpus studies have been carried out using IAT. The set of IAT analyses applied to mediation discourse has been gathered in the Dispute Mediation Corpus (DMC), the first open corpus of medi-

ation dialogues specifically created for the present work and future research in the domain. This resource is valuable to academics working on dispute resolution practices but also to experts interested in dialogues or argumentation in general.

Discovery and modelling of dialogical dynamics and argument structures in mediation discourse Corpus analyses stored in the DMC have allowed discovering mediation discourse dynamics in more detail than had hitherto been done in the major research works presented in Chapter 2. Starting from what the literature had provided with respect to what the main aspects of discussions in mediation are– such as the argumentative stage, the open generation, the strategies deployed by mediators to resolve impasses, etc. – mediation excerpts have been annotated with IAT to reveal the dynamics of each of these aspects. The analyses have allowed showing the link which is created between dynamics of dialogues and argument structures thanks to IAT's annotation scheme for illocutionary forces. Moreover, IAT analyses have revealed how some of the most frequent illocutionary forces – such as Asserting, Assertive Questioning, Arguing, Agreeing and Disagreeing – are used by speakers, and what for. Each particular excerpts annotated has revealed how the dynamics between speakers' verbal exchanges create arguments, counter-arguments as well as how discussants Rephrase propositions. The structure of dialogues, the illocutionary forces at stake and the argumentative dynamics derived from them have highlighted the marks of each aspect studied. As an example, we have seen that when mediators argue, they subtly do so, by using Assertive Questions rather then Assertions which might undermine their neutrality. The high level of detail of IAT analyses has therefore permitted decomposing mediation dynamics and relating them to mediation discursive process. These findings are useful to understand what characterises the mediation argumentative process. Moreover, all the excerpts analysed in Chapter 4 have also been modelled to disregard the actual content of the discussion, keeping only track of the dialogical, argumentative and illocutionary structures of the aspects studied. For instance, the modelling of the mediators' strategy of redirection has been characterised by the absence of transition node between the mediator's move and the prior discussion.

Definition of the first dialogue game for mediation In-depth analyses of mediation discourse and empirical knowledge provided by the literature have contributed to the definition of the first-ever dialogue protocol for mediation. Indeed, the literature review in Chapter 2 has taught us how a mediation session typically unfolds, and IAT analyses in Chapter 4 have provided the necessary knowledge with respect to what the typical speech acts are and how speakers verbally behave along the session. The dialogue protocol for mediation consists in a set of rules constraining speakers accordingly. The rules for this dialogue game have been first elaborated in natural language and, later on, in a language specifically developed for dialogue games: the Dialogue Game Description Language. The Argument Interchange Format has indeed led to this standard language, so that any dialogue protocol can be translated in AIF terms in order to enable the reusability and exchange of games between different computational tools. During the evaluation process which preceded the implementation of MDG′, its former version, MDG, has been contrasted with real mediation dialogues in order to discover its limitations and enhance it. A set of differences has been detected and MDG rules have been revised accordingly to create MDG′. MDG′ is not only the first dialogue game for dispute mediation, but is also one for three players, which is still rare in the history of dialectical games. MDG′ therefore extends knowledge in dialectical games and mediation: it can be used as a normative model, to which mediation dialogues can be compared.

Execution of the first mediation dialogue game in a conversational support system With MDG′ – which has been developed as a support for mediators' training – the aim is not to evaluate mediators or their techniques, and the tool does not aim at recommending solutions. Eventually, the mediator's competence could be evaluated by himself or by his teachers. Even though the rules of the game can be used as a normative model to which mediation dialogues can be compared (as has been done in Chapter 6), the game primarily aims at replicating mediation dialogues in order to help mediators implementing their skills and techniques in a computational environment to allow them to test different scenarios.

The mediation dialogue game, MDG′ is specified in DGDL, which has offered the possibility to execute it. This testifies that this first dialogue game for mediation has an-

other quality: not only is it a normative model but it is also a practical tool. The Dialogue Game Execution Platform, DGEP, is a framework for the execution of dialogue games written in DGDL. It has been used to play MDG′ in Arvina, a conversational support system. Three users took the roles of the predefined players – who are the mediator and two parties – and engaged in a conversation constrained by the rules of the game. To do so, the users have been given an excerpt of a real mediation dialogue and have been asked to use Arvina, in which MDG′ had been implemented, to replicate the discussion. The game has been designed in Chapter 5 so that the mediator is the only user to advance strategic moves since the original goal of the present study is to deliver a practical tool to support mediators' training. Mediators therefore lead the discussions in MDG′ and react to the other players' moves, who are constrained to assert propositions, trigger their the opponent's agreement, and answer the mediator's questions and challenges. The results of this experiment are encouraging, since the dialogue in Arvina was sufficiently constrained to allow only Mediator to lead the discussion, whilst the discussion was still close to the one in the mediation excerpt. The implementation and execution of this game has proved that computational tools can help in replicating complex dialogical discussions. The execution of MDG′ shows that dialogue games are a useful tool to mimic real conversations and that using conversational support systems such as Arvina can help designing practical tools which are user-friendly and which could provide a valuable aid to support professionals. The evaluation process which has come along with the construction of the game has already shown that several discursive and argumentative characteristics deserve to be further explored so that the game accounts for a wider range and more accurate dynamics. Such two major characteristics have been explored in Chapters 5 and 7. Firstly, it has been shown that the dialogue type prevailing in a mediation session yields argumentative and dialogical differences; for instance, in a negotiation – or bargaining – type of mediation dialogue, such illocutionary forces as Offering and Rejecting are more frequent and more representative than in a therapeutic type of discussion, which is rather marked by the illocutionary forces Apologising or Explaining (Section 5.5). Secondly, the frequency of uses of reported-speech detected during the evaluation process, and not taken into account in MDG′, has led to an in-depth analysis of uses of SAY, a typical meta-discursive verb

which is regularly used by speakers to report someone's words.

In-depth exploration of meta-discourse in mediation dialogues The presence of meta-discourse in dispute mediation discourse is not surprising since mediators often summarise or reformulate disputants' points of view. Meta-discourse is therefore ubiquitous and, as a first step towards a more comprehensive account of meta-discourse in mediation, Chapter 7 focused on a single meta-discursive element: the verb SAY in present and past tenses with first and second subject pronouns. It has been shown, through IAT analyses, that SAY is mainly used to report someone's words and that this characteristic of language is linked to speakers' tactics. More precisely, we have seen that SAY is used by speakers to argue, agree, disagree and restate their interlocutors', a third person's or their own words, and that these acts belong to different types of tactics. By using SAY, speakers may act at different levels of the discourse: (i) the dialogical level when locutions are used to build an illocutionary act, (ii) the rhetorical level when speakers play with the (supposed) illocutionary force of the proposition they report, and (iii) the argumentative level when the propositional content of a locution allows a speaker to build her argumentation. In other words, when a speaker uses SAY, she gives importance to either a verbal act itself, or the way it has been brought about, or else its content. This account of meta-talk extends knowledge in mediation discourse and in argumentative discourse in general since this type of approach can be applied to other dialogical contexts, and with other meta-discursive elements, in order to further explore the role of meta-discourse in dialogical arguments. These findings have not been included in MDG′, since they are only preliminary steps towards a more comprehensive account of meta-talk in mediation; the established results, however, lay a foundation for future studies of mediation discourse. This study has therefore brought several advances in various domains, from discourse analysis to computational development and dispute mediation which can be useful to future research on the topics.

8.2 Future work

The work reported throughout has shown that a few topics need further investigation in order to better understand the rapidly growing mediation process and how to better accompany dispute resolution professionals.

Exploration of additional mediation features and comparison between different sessions Additional close analyses of mediation discourse need to be carried out in order to gather more information as to the complexity of mediation discourse. Analysing transcripts from a wider variety of situations with respect to the type of case (e.g. divorcing couples, child custody etc.) will lead to a more comprehensive account of the mediation process. Moreover, the analyses and the modelling of the aspects of mediation already annotated in Chapter 4 for example will require to be contrasted with analyses of the same aspects in other cases. The goal will be to verify whether the findings, which have led, among other things, to the definition of MDG′, can be generalised to mediation in general and, consequently whether they should be taken into account to improve the dialogue game. The analyses presented in Section 4.2 make it possible indeed to represent the complex structure of mediation discourse, particularly from the mediator's point of view. By comparing analyses of the same type of situation (e.g. *redirection*) but from different cases, it will be possible to verify whether some argumentative strategies and tactics apply to most of mediation sessions. As an example, we could check whether all the analyses of *redirection* present the same feature, i.e. the mediator interrupts the discussion via a question which has no link with the topic addressed just before (see for instance Section 4.2.2). The Dispute Mediation Corpus will ease the task of annotating more mediation excerpts, by allowing storing additional analyses and comparing with the ones already saved in the database. Extending this resource will provide further information with respect to the various dynamics in mediation, which is of interest for research in conflict resolution studies, argumentation or discourse analysis. It is overall crucial to better understand the argumentative practice of mediation. Moreover, it will be possible to account for more discursive details proper to this conflict resolution process, and include them into MDG′, the first dialogue game for mediation.

In the present research, mediation discourse has been analysed using IAT. The assets of the framework have been demonstrated throughout. IAT, however, has some limitations. It is focused on the analysis of argumentative texts/dialogues. Despite its possible role in argumentation, non-verbal communication cannot be processed in IAT. As future work, it would be interesting to carefully analyse non-verbal or even non-argumentative communication in mediation, in order to highlight their roles and functions in mediation dialogues. As we have seen in Chapters 4 and 5, mediators sometimes shift the discussions towards therapeutic dialogues, in which feelings and emotions play a major role. While argumentation constitutes a considerable part of such discussions, it is important to highlight the extent to which feelings and emotions expressed by speakers lead to a change in the mediators' behaviours and decision to focus on them during the dialogues. As we have seen, IAT is flexible enough to allow new annotation schemes to be added. For instance, Budzynska (2013) uses IAT to analyse ethotic arguments; she adds a scheme set for representing the credibility of speakers. It would be possible to propose an additional scheme set in IAT for the representation of speakers' emotions during the dialogue and hence put into relief their roles in the overall argument in mediation discussions. This would only be possible with videos of such discussions. Hitherto, only text has been analysed, and all emotions cannot be captured through text. As part of the future work, IAT analyses of mediation dialogues therefore could take into account the non-verbal communication of feelings and emotions which are more easily captured by videos. To this aim, a larger corpus containing video-recorded mediation sessions will have to be built.

Extending MDG′ As we have seen mainly in Chapter 5, MDG′ can be considered as a basic dialogue game for mediation, close to a critical discussion. Other types of dialogues however take place in mediation (bargaining, therapeutic). A preliminary investigation on the differences between these three types of dialogues has been proposed in Chapter 5, and in Chapter 6 it has been shown that accounting for these differences would lead to a redefinition of MDG′. We have seen that there are at least two other styles of mediation; creating a game for each type of dialogues in mediation will require additional analyses to detect the precise differences between them; then, it will be necessary to model the types of discussion as has been done in Chapter 4 so that a dialogue protocol proper to

each game can be defined, and implemented. It is not clear yet whether the game should be refined into two other games for mediation (i.e. one for each type of discussion) or whether the game should be adapted so that users can navigate between the types of discussion as the dialogues proceed, therefore creating a kind of hybrid system; however, taking into account the differences of dialogues in mediation will definitely bring a more accurate game and a system in which trainee mediators can practice their skills in a more realistic environment. Jacobs and Aakhus (2002b) have been the ones who have identified the three different types of dialogues occurring in mediation; incorporating insights from IAT to the dialogue types in mediation may be of a big value to many academics interested in dialogue types such as Walton (2007) and mediation procedures such as (Wall and Chan-Serafin, 2014; Rule and Sen, 2015), etc.

Furthermore, exploring a larger range of characteristics of mediation dialogues, is crucial: including them in MDG′ will make it possible to build a tool which takes into account the variety of conversational dynamics. As mentioned in Chapter 6, the Mediation Dialogue Game is not yet a ready-to-use tool. The rapid development of mediation, however, makes it crucial to deliver a fully-fledged tool for mediators. Once additional features are integrated in MDG′, it will be necessary to carry out an end-user evaluation so that mediators can test the tool and confirm its utility and usability.

A deeper account of meta-discourse in mediation The study of meta-discourse in Chapter 7 was a preliminary step towards a deeper account of this linguistic characteristic in mediation since only a single element of meta-talk has been analysed. The verb SAY in mediation is indeed a small part of the myriad of potentially meta-discursive elements, but the study of its role testifies to the importance of meta-discourse in mediation, as well as in other argumentative dialogues. We have seen in particular that speakers' use of meta-discourse highlights dialogical, rhetorical and argumentative tactics. These findings have an influence on the global vision of the mediation process, and, as was mentioned in Chapter 7, allowing MDG′ users to advance meta-discursive moves would make the game closer to the reality of mediation dialogues. For instance, commitment-stores could be used by players to retrieve past claims and advance them again in the form of reported-speech. It is however necessary to have a larger picture of the use and role of meta-talk,

permitted by additional analyses of mediation dialogues. It will also be necessary to verify whether meta-discourse plays a role in the outcome of mediation. The question to be answered is: do uses of SAY and other meta-discursive devices effectively serve the resolution of the conflict? In other words, are mediations more efficient (i.e. effectively lead to a resolution of the conflict) when speakers, and mediators in particular, use metadiscourse a lot? This topic therefore deserves to be further explored, first to include the possibility for MDG′ users to set up strategies with meta-discursive moves, but also to account for the role and function of meta-discourse in argumentation in general. Again, the DMC can be a valuable tool to tackle this challenge since a sub-corpus Meta-talk has already been created which gathers not only the excerpts presented in Chapter 7 but also analyses of dialogues in which meta-discourse has been intuitively detected along corpus studies. Meta-talk is apparent in mediation through other verbs and expressions than SAY; some possible avenues for a deeper investigation of meta-talk are therefore the taking into account of other speech verbs (that is, other than SAY) or of discourse connectors. The goal will be to verify whether more functions of meta-discourse in argumentative dialogues can be identified. Nevertheless, this challenging task will not only lead to a better understanding of mediation dialogues, but it will also inevitably have an impact on the area of discourse studies as a whole.

It has been mentioned earlier that gathering a larger corpus of mediation transcripts is required to get a more accurate vision of mediation argumentative dialogues. Despite the challenges it represents – given the scarcity of resources mentioned in Chapter 4 – focusing on real mediations, rather than role-plays, will definitely be useful to see whether the strategies and techniques presented in this work play a significant role in the mediation outcome. It will be particularly interesting to check whether an abundant use of meta-discourse has an influence on the resolution of the dispute, that is, whether mediations are more successful when mediators use meta-discursive moves a lot.

Making use of the AIF tools to implement a game with virtual agents We have seen that mediation training mainly consists in role-plays, which requires the presence of an expert mediator to coach the mediators-to-be. For now, MDG′ only has been tested with three human players, but it will be possible to replace the parties by virtual agents so that

trainee mediators can practice their skills on their own. AIF has motivated the creation of plenty of tools to make use of argument analyses in several ways (see in particular (Reed et al., 2017)). In the present work, for instance, OVA+ has been used to analyse mediation dialogues; the Dialogue Game Description Language, in which MDG′ has been specified, also makes use of the AIF format. Most importantly, all the analyses presented throughout the current work have been stored in AIFdb, the richest database of analysed arguments. Arguments in AIFdb can be used in all the tools relying in the AIF, making it possible to share, exchange and reuse them. It is therefore possible to take advantage of already analysed arguments stored in the DMC to allow virtual players to advance realistic moves and arguments. Arvina, the system on which MDG′ has been executed, permits such a retrieval of analysed arguments in AIFdb. Users of MDG′ could therefore engage in a mediation dialogue with two agents who would answer and react to the human user's moves by advancing claims from AIFdb. These claims having been analysed and the argument structures being stored, the agents' moves would be realistic and rational. If implemented, this additional feature would therefore allow training mediators to practice their skills and competence on their own; it will also represent a new multi-agent systems, in which players' contributions would be tantamount to natural language mediation dialogues.

The different tasks mentioned here represent challenges which need to be tackled, not only to propose a more accurate, realistic and practical Mediation Dialogue Game (via the implementation of three different types of discussions for instance), but also to extend knowledge in mediation discourse in general. Additional analyses of mediation dialogues will inevitably lead to the discovery of mediation features which can be incorporated in MDG′ but will also bring new insights upon how argumentation in mediation takes form. A wider exploration of meta-talk in mediation will bring new knowledge about speakers' strategies which can be valuable to conflict resolution studies, linguistics and argumentation theories for example. In sum, the investigation of mediation discourse brings and promises to bring advances in several domains of research, and not only to conflict resolution practices.

8.3 Concluding remarks

The study of the relationship between dialogues and arguments in mediation discourse has brought advances in various domains, from discourse studies to computational models for argumentative practice through argumentation theory and dispute resolution studies.

Already well documented thanks to the works of Greco Morasso, Aakhus and Jacobs among others, argumentative discourse in mediation has been further explored here with the help of a powerful framework for the analysis of argumentation in dialogical contexts: Inference Anchoring Theory (IAT). Dialogues indeed can reveal non-obvious patterns of argumentation put into relief by IAT in-depth analyses. Not only characteristics of mediation dialogues described in previous research in the domain – such as the mediators' efforts in avoiding to give their opinion, or the strategy of redirection for example – have been detected and described in details, but other dynamics have also been identified. IAT has allowed discovering the relationship between dialogical dynamics and argument structures, and has revealed how mediation participants typically behave, but the analyses have also brought new findings in the use of meta-discourse in mediation. For instance, it has been shown that speakers in mediation rely on meta-discourse to put dialogical, argumentative and rhetorical tactics into place (Chapter 7). It has also been shown that reported-speech is not just about saying what someone said, but about using what has been said to create one's own argument or counter-argument, or even to convey agreement or disagreement, and finally to rephrase propositions.

In Chapter 4, it has been shown that, given the confidentiality of the mediation process, it can be hard to obtain transcripts or audio-recorded mediation sessions; this type of data is necessary yet to study mediation discourse. Some possible paths to obtain and gather data have therefore been given. Then, a corpus of mediation dialogues, the Dispute Mediation Corpus (DMC), has been introduced, which was then used throughout the study. This corpus of argument analyses has been created for the need of the present work: it is composed of IAT analyses of mediation discourse and is stored and freely available in the AIFdb Corpora webpage. This resource is the first corpus of argument analyses of mediation dialogues, made available in open access to boost research in mediation discourse. It can be useful to academics working on mediation, but also to linguists

or argumentation theorists, etc. The DMC has been gradually constructed as the research presented here moved forward. Every analysis of mediation dialogues has been stored. This has allowed revisions of the argument analyses to be made as the study was on its way. Not only has IAT been applied to mediation discourse for the first time, but the framework has also been developed in fundamental ways. As an example, when it turned out that the basic illocutionary forces used in IAT – presented in Chapter 3 – missed to grasp some important characteristics of mediation discourse, it was possible to retrieve old versions of argument analyses and to revise them with more accurate illocutionary connections, such as *Offering*, *Rejecting*, *Ironic Asserting*, etc.

The IAT analyses stored in the DMC have been the basis of the construction of the first dialogue protocol for dispute mediation. Starting from empirical knowledge and IAT close analyses of mediation discourse, dynamics of mediation dialogues have been modelled and integrated in the first dialogue game for dispute mediation, MDG′, which itself has been implemented in a conversational support system, Arvina. The game being designed as an aid for mediators, it allows mediators to practice their skills in a user-friendly environment, in which two other human players – or potentially two virtual agents – can play the role of disputants. Though more dynamics must be accounted for and potentially added to the Mediation Dialogue Game′, the system already matches the reality of mediation conversations and stands as the corner-stone of a practical tool to support trainee mediators. Most importantly, contrary to dialogue games falling in the scope of philosophical approaches to argumentation (e.g. (Hamblin, 1970)), the mediation dialogue game has been implemented in computational systems: the benefit of this computational implementation is two-fold: first, it easily allows identifying (and, if necessary, revising) the dialogue modelling; secondly, it offers both a normative framework with which mediation dialogues can be compared, and a practical tool supporting mediation conversations as well.

The research reported here is based on empirical and normative methods. Corpus analyses form the largest part of the present work, in which mediation dialogues are systematically analysed using IAT. In this task, little room is given to interpretation: analyses of discussions in mediation consist in eliciting dialogical dynamics to derive the argument

structure of the speakers' verbal exchanges. Only textual data is analysed; for instance, enthymematic arguments are not reconstructed. Corpus studies only rely on an empirical approach. On the other hand, the empirical and statistical analyses of mediation dialogues have led to the development of a dialogue game. This game can be used as a model with which mediation dialogues can be compared. MDG′, therefore, can be considered as a normative model. Consequently, the present research relies on empirical methods to deliver a normative model and shows the importance of using empirical evidence to create accurate and realistic tools.

To sum it up, the work presented throughout described the different steps towards the development of a computational tool for mediation. Exploring the intermediate point between dialogical dynamics and argumentative structures has been shown to be crucial in building a practical software tool for mediation, a particularly challenging context of discourse. The work reported here takes initial steps to open up a route to novel computational models which are liable to make a significant impact on this rapidly growing area of professional argumentation.

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